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HIDES AND SKINS

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FROM THE ANIMAL'S BACK
TO THE TANNERY DOOR

Written by Specialists and Authorities in the
Several Departments of the Hide
and Skin Industry

Chicago, U. S. A.
SHOE AND LEATHER WEEKLY
1912

TS967
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No 1





FOREWORD

This volume is issued in response to a demand for information in respect to hides and skins. Articles bearing on this subject appear from time to time in the trade press, but, as far as our observations go, there is no bound compilation of data on this important department of the leather industry. It has often been said that the literature of tanning is not extensive. If this be so, it may be declared that there is a very decided necessity for a book dealing with hides and skins in their raw state.

In this volume it is aimed to deal with the raw material of tanning from the animal's back to the tannery door. Thus it will be seen that we end our discussions where the tanning books begin them. It would seem that the manufacture of leather is of sufficient importance to justify the publication of many works on hides and skins alone. This volume may be considered a pioneer in that it breaks practically new ground. There are no books extant from which we could gather information supplementing them with matter of our own, as is usually the procedure in compiling a new work on a well-worn subject.

It is not possible that any one man could have written all the matter herein contained. The subject is so complex and covers such a wide range that many authorities were of necessity called upon to write chapters concerning the branches upon which they are specially well informed. With the exception

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of three articles read before the American Leather Chemists' Association, all the chapters are original and are here printed for the first time. Contrary to the course sometimes pursued, the matter in this volume is not a collection of reprints from trade journals.

This book deals with a business subject, and no attempt has been made to assume a lofty or scientific tone. For the most part, the articles and chapters are written by plain, practical men, who, while making no pretensions to literary style, are experts in their several departments.

It is generally understood that the world's supply of hides is not keeping pace with the requirements of the leather manufacturers. The United States always has been a large importer of hides and skins, because of the inadequacy of the domestic supply. In recent years the scarcity of raw material for tanning has become more acute. It was this condition which compelled Congress to repeal the duty on hides in the revenue law of 1909. Although enjoying equality of opportunity with other manufacturing nations in respect of hides, the tanners of the United States are becoming more and more dependent upon foreign sources of supply. Many tanners who formerly used hides of domestic origin exclusively, now are compelled to import a large proportion of the raw material they consume. In view of this condition, it was thought that some information in book form about foreign hides would be welcomed by the trade.

The take-off, curing and handling of packer hides are very thoroughly gone into. Packer hides, as sold by the great beef firms of Chicago, are universally considered to be the best in pattern and condition. They

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bring at least two cents a pound more than hides taken from the same grades of cattle by local butchers and farmers. It is therefore of the highest importance that all slaughterers of cattle should obtain all available information which will enable them to improve the quality and value of their hides.

This work is primarily a text-book, and would not be complete did it not give many points that are everyday knowledge to the experienced handler of hides. Because of the thorough manner in which the subjects are treated, the volume will be valuable alike to well-versed men and the younger generation who must ultimately take their places.



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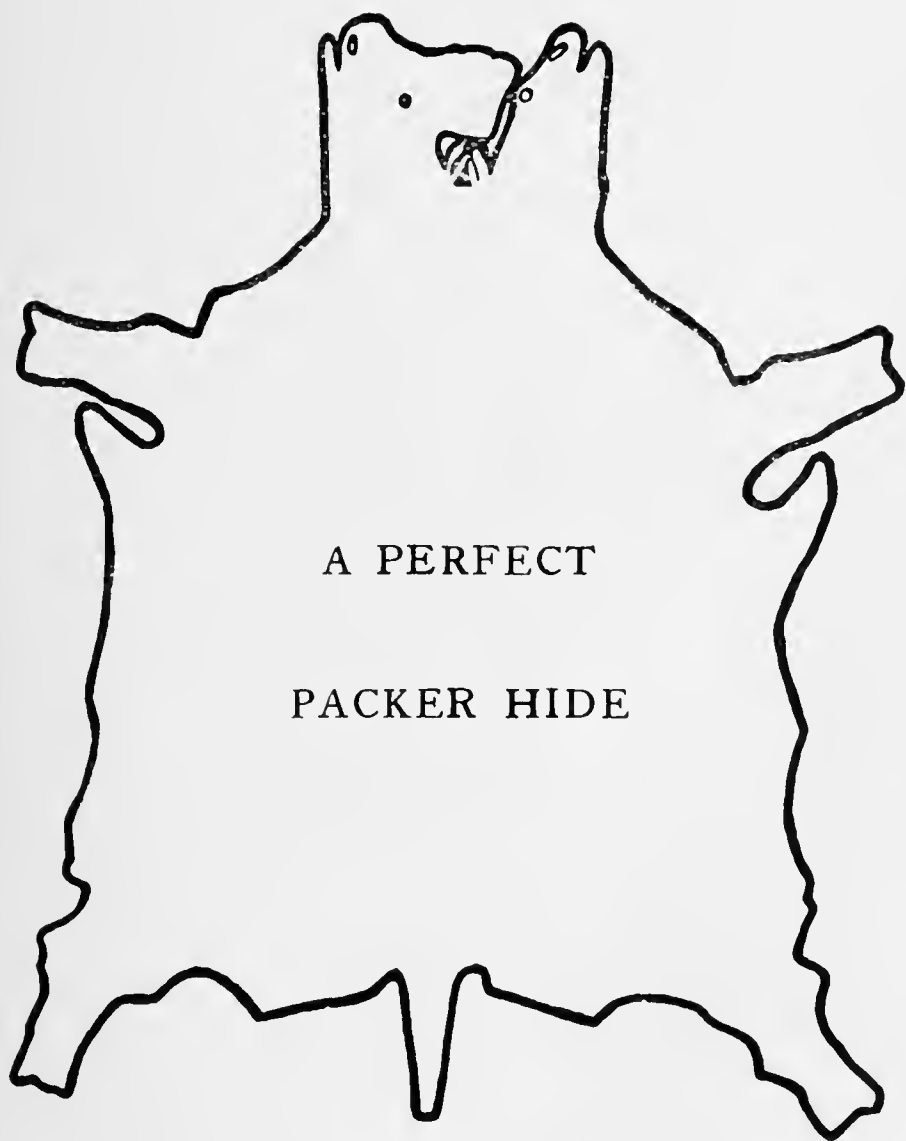
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HIDES and SKINS



HIDE FIBRE

By **ROBERT W. GRIFFITH**

It is a basic condition upon which the production of leather depends that the original fibre of the hide or skin remains intact, and indeed the whole art of tanning is directed towards the preservation of the fibre, so that a state in which the fibres retain their original pliability and tensile strength is common to the raw hide as well as the leather. It was well understood by old-time tanners that the processes involved in transforming hides into leather did not tend towards an improvement in the desirable characteristics of the former, but the tendency to rapid decay made it absolutely necessary that some process which preserves the fibre be employed in order that the hide could be made serviceable for the varied uses to which it is put.

Preservative Processes.

These preservative processes, which are now called tannages, were originally very crude, but the number of such processes in use today is almost innumerable, and their action on raw fibre so varied and complex that science, which has done so much to indicate the way, has hardly kept pace with practice. Although tanning can be properly described as a preservative process on hide fibre, it is not proof against the influences which bring about the disintegration and decay of the fibres. The raw fibre decays very quickly by putrefaction, due to bacteriological action, which liquefies it; the tanned fibre undergoes a process of disintegration which, however, may occupy many years to bring about.

Although the tanning processes cause a disturbance in the original fibre formation, it is very desirable that

this formation should be interfered with as little as possible, but the exigencies of modern demands in the case of heavy leathers bring about a distention of the fibres to almost their fullest extent in order that the interfibre spaces can be filled with a heavier material than nature has provided.

Distinction of Hide Fibre.

Hide fibre is distinct in every characteristic from all other organic fibres produced by natural growth, such as cotton, wool, wood, etc. The cell walls of vegetables do not contain nitrogen, whereas all the cell walls of hide fibre do, and on scientific grounds there appears to be little possibility of producing a fibrous substitute for leather, which is made by a preservative process from hides and skins. It is true that all organic fibres are cellular, but the hide fibre has a certain elasticity peculiar to itself, which gives it greater tensile strength than other fibres, but it is in the wonderful interweaving of those fibres together in the corium, or true skin, that nature far excels the cunning of human handicraft, and its successful imitation makes the production of leather from other than hide fibres a very remote possibility.

Structure of the Hide.

The hide or skin, when performing the functions for which it was originally designed, is not only a covering for the animal, but is an essential part of that complex system upon which life depends and is an organ of secretion and provides a channel for the elimination of many organic impurities and also possesses the sense of touch. In general principle the skins of all mammalia are the same. The skin consists of two parts, the outer, called the epidermis, and the inner, or true skin, is called the corium, and it is with the latter that the art of leather manufacture has to deal, because the epidermis is not strictly a fibrous structure and, in fact, is entirely different and owes its origin to a different layer in the germinal cell. The epidermis forms a separate but very thin skin, and it

is untannable and to a certain extent waterproof, so that in the preservation of the complete hide structure the penetration of the tanning agent takes place from the corium. The epidermis is commonly spoken of as having two layers, the heavy layer and the mucous layer. This is due to the fact that in the growing of the epidermis the cells based on the true skin grow outward, which, as they are pushed by growing cells further from their source of nourishment, become dead and flat, similar to scales. The epidermis layer produces the hair and hair sheaths, the sebaceous, or flat glands, the sudoriferous, or sweat glands, and other structures of a horny character, such as horns, hoofs, claws and finger nails, which are analogous to exaggerated hairs, such as are seen in the quills of a porcupine.

Although the various structures which have been named as arising from the epidermis are very different in their outward appearance, they are all constituted of simple animal cells, differing only in size and shape and secreting cell walls of keratin or horny matter, a substance which is nearly allied chemically to coagulated albumen.

The epidermis layer is entirely dependent for its growth upon the nourishment which it derives from the lymph of the true skin. The chemical behavior of the epidermical structures is very different to that of the true skin. On boiling in water the latter forms gelatin, whereas the former are not at all easily soluble in water, even under pressure. The alkaline sulphides render the keratins very soluble, but do not readily attack the corium, or true skin, and this fact is made use of in practice for removing the hair preparatory to tanning.

Fibre and Gelatin.

As far as it has been determined there is apparently no chemical difference between the hide fibre and gelatin, with the exception of an unknown quantity of water, but there is a very pronounced physical difference. The fibre of the hide or skin is completely dissolved on boiling in water and is entirely lost and cannot be reformed by any

subsequent process. This is caused by a total destruction of the cell walls of the fibre, which, being of the same composition as the gelatinous liquid contained within the cell, takes up an equal quantity of water and forms a homogeneous mass on cooling. All organic cellular fibres do not act in this way; for instance, cotton fibre, when in a solution of amyl acetate, can be precipitated in a fibrous state by the addition of gasoline. The chemical reactions of gelatin are practically identical with those of hide fibre, and a close study of the behavior of the former is invaluable towards aiding a scientific manipulation of the latter.

Decomposition of Hide Fibre.

But it is not the present purpose to discuss the properties and behavior of gelatin, because little, if anything, can be added to the work which Procter has already published on the subject. Let us rather return to the consideration of hide fibre in its original state and endeavor to emphasize the results of simple observation in an effort to eliminate a common tendency on the part of chemists in making laboratory deductions to attribute effect to other causes than the condition of the fibre. Now, having regard to the susceptibility of the fibre in the fresh hide to rapid putrefaction, it is evident that it is necessary to arrest this as quickly as possible in view of the fact that the process of decay sets in immediately that the flaying of the hide is completed, and in order that a hide may become a marketable commodity it undergoes a treatment, which is a method for its temporary preservation. Such treatment is not at all in the nature of a tannage and is generally referred to as a "cure."

Methods of Curing.

There are a variety of methods for curing hides peculiar to the locality from which the hides emanate, and it is in one of these conditions that hides are received by the tanner. It is apparent that the nature of the "cure" must have some influence upon the hide

fibre and to some extent influence the character of the leather, irrespective of the tannage employed.

The simplest form of cure consists in the process of drying the hide by exposure to the sun and air, which is the method commonly adopted in most tropical countries. The success of this method depends upon the evaporation of the moisture held within the fibres slowly and evenly, yet completely, and as all putrefaction requires moisture, it follows that the elements of decay are suspended temporarily. A hide thus treated is known as a flint dry hide. Although this form of cure has the advantage of simplicity, its effect upon the fibre is sometimes very complicated, and unless carried out with some degree of care it becomes the foundation of considerable trouble in the subsequent tannery processes. With the evaporation of the moisture from the hide fibre considerable shrinkage takes place, by which the fibres are drawn tightly together, and as the hides are dried without previously washing, all the albuminous matter and free gelatin surrounding the fibres are dried with them and form a hard, solid mass resembling glue.

Imperfect Drying.

If the hide dries too quickly the result is that both surfaces of the hide harden with the contraction of the fibres before the moisture in the middle of the fibre has been evaporated, so that this moisture is imprisoned, as it were, and provides a medium by which bacteria can be nourished at the expense of the fibre, with the result that it is completely destroyed where this action has taken place. One of the great difficulties attending damage of this kind is that it is impossible to detect it in the hide until the hide has reached the tanner and has gone through the beamhouse processes, and very frequently it is not observed until the leather made from such damaged hides is cut, when it will be seen that the leather splits into two pieces without difficulty. An examination of leather so damaged under an ordinary magnifying glass shows the broken fibre as if the ends had been fused.

It frequently occurs in damage of this nature that it extends to almost the length of the fibre, leaving the surface of the grain and flesh intact, but before the beam-house processes are completed these give way and a hole is made in the hide.

Temperature in Drying.

The temperature at which hides are dried is of considerable importance to their subsequent manipulation in the tannery. Eitner, who has experimented in this direction, states that the ideal conditions for drying hides would be in a vacuum at a temperature of 15 degrees centigrade. Hides dried at a temperature of 22 degrees centigrade in the sun soak back in 48 hours. Dried at a temperature of 35 degrees centigrade, artificially, hides required five days to soften, in each case without mechanical aid. Hides dried at 60 degrees centigrade in an artificial heat refused to wet back by any method sufficient for tanning purposes.

The influence of temperature upon hide fibre is obviously of great importance, and low-drying temperatures are the best suited. Albumen coagulates at a temperature of 60 degrees centigrade, so that such a temperature affects the albuminous matter in hides. Hide fibre in a moist condition, at a sustained temperature of 35 degrees centigrade, rapidly deteriorates, chiefly from bacterial activity. On account of the protection which the fibre of the true skin receives from the epidermis, hides do not appear to be much affected, so far as their structure and tensile strength are concerned, after a quick immersion in water at a temperature of 50 degrees centigrade.

Salting Hides.

The other of the two most common methods employed in curing hides is that of salting. This is carried out in two ways—first, that of spreading common salt on the flesh side of the fresh or green hide, and known as green salted hide, and the second is known as

“dry salting;” the hide after being salted in the fresh state is spread out and dried in the sun.

Common salt is preservative in the sense that it possesses antiseptic properties, but is not a disinfectant. In a solution of water it has a solvent action upon hide fibre, but its action in “curing” or preserving hide fibre is due to the property which it possesses of taking up water, and this it takes out of the fibre, thus dehydrating it or, in other words, it acts as a drier on the fibre. The influence of salt upon the fibre from the tanners’ point of view is decidedly beneficial. Its use upon the hide permits of a ready diffusion of water into the fibre in the process of soaking, and the hide is very readily softened without much mechanical aid.

In soaking the hides preparatory to tanning a considerable part of the salt is removed from the hide, but its complete removal from the fibre is scarcely practical, even if it were desirable, which, however, is not the case. The influence of salt upon the fibre can be observed very strikingly in the case of a flint dry hide which has been given a brine bath as a second soaking in the process of softening. The result is a great improvement in the subsequent leather. It would be of considerable advantage, wherever practical, where dried hides are tanned, to salt them after properly soaking and allowing them to lie in a small pile for a few weeks, then washing and treating the hides as if they were regular green salted hides.

Salt Stains.

One of the troubles arising from the use of common salt is what is known as salt stain. This is due to the presence of iron in the form of ferric chloride in the salt, but this only occurs generally in rock salt and can usually be avoided by employing salt of greater purity. Frequently stains occur on hides, due to the use of stale salt; that is, the salt which is shaken off the hides preparatory to their being folded for shipping. This salt carries with it considerable blood and organic matter from the flesh

of the hides and this, accumulating, is finally deposited on a hide, to the detriment of that particular hide. It is obvious that as the salt crystals become coated with albuminous matter they cannot be as efficient in their action as fresh salt, and the use of such salt is not advisable.

To further lessen the tendency to salt stains, hides should not be stored in a damp atmosphere. There is no doubt but that it can be demonstrated that the use of clean recrystallized salt avoids so-called salt stains.

Dry Salting.

Dry salted hides are not salted in the initial stage of the curing process with the same care that a packer hide is given, and the material used for salting is more frequently a saline earth. The additional process of drying the hide safeguards it from any injury which the impurities contained in the saline earth may be apt to cause. In India what are known as plaster cured hides are really dry salted, the natives employing a saline earth for that purpose. Procter carefully investigated the chemical constituents of this earth and found it to be composed principally of sodium sulphate (glauber salts) with only traces of common salt (sodium chloride) present. This suggests the experiment of substituting anhydrous glauber salts for common salt for curing fresh slaughtered hides and this can be very successfully done to some advantage because the resulting leather is "fuller."

Glauber Salts.

It is known that sodium chloride has a tendency to produce flatness in leather whereas sodium sulphate has not this characteristic, and although in tannery processes the salt employed in the cure of the hide is largely removed, traces of it exert some influence, not necessarily objectionable, upon the fibre, the effect of which may sometimes be found upon the resulting leather. Although the higher cost of anhydrous glauber salts, over crude common salt, may constitute an objection to its larger

use as a substitute for the latter, there is no doubt but that in the manufacture of certain kinds of leather like chrome tanned upper leather, the result obtained by the use of glauber salts fully compensates for the slight increase in cost.

The influence of the method of curing the hide is very important upon the leather made from such a hide and a study of the effect of the "cure" upon the fibre is of considerable value.

Disinfection of Hides.

The influence of disinfectants which are frequently employed upon hides must not be overlooked because of their possible effect upon the fibre, depending, of course, upon the nature of the materials employed for disinfecting. The mercuric salts, for example, form insoluble compounds with albumen, and formaldehyde has considerable influence upon the fibre, entering as it does into intimate combination with it and producing a "tanning" effect.

Effect of Tanning Upon Fibre.

Dealing with so delicate an organic structure as hide fibre, it is frequently impossible to determine with any great certainty the exact causes which produce certain defects, but with the introduction of systemized tannery methods, the element of chance is being rapidly eliminated. The fact should never be lost sight of that the hide fibre is the first and last consideration and that the value of all processes depends upon their effect upon the fibre. The action of depilants and of beamhouse processes in general is pretty well known, if but imperfectly understood. Apart from the chemical action of the materials employed in the beamhouse the influence of time and temperature upon the hide in the "white" or pelt condition cannot be too carefully controlled.

The action of tanning materials, both mineral and vegetable, upon hide fibre, is varied, and apart from the characteristics of each material, uniformity of effect depends upon the exercise of great care and control of the

material or combination of materials employed. It is not within the scope of the present chapter to discuss in detail the different characteristics and properties of the various materials which are employed in the conversion of hides into leather, but having regard to the influence of the two great classes of materials, mineral and vegetable, upon the fibre, the popular idea that the chrome tannage produces a tougher fibre than the vegetable tannages is not strictly true so far as the actual tannages are concerned. Great tensile strength in hide fibre depends upon the amount of moisture which the tanning material permits the fibre to retain, and although in the finished condition chrome tanned leather frequently proves to be the stronger, this is largely due to the water emulsions of oil which are used in the fat-liquoring process, applied to the fibre while still wet from the tan bath. Chrome tanned leather thoroughly dried direct from the tan bath has no remarkable tensile strength, but perhaps the most striking feature possessed by chrome tanned fibre is the property of being able to resist the action of boiling water.

Despite the fact that the alum in alum tanned leather can be removed from the fibre by washing and consequently is not very intimately combined with the fibre, in combination with common salt, which is hygroscopic and retains moisture tenaciously, such leather is often of extreme toughness.

Vegetable Tannins.

Each of the vegetable tannins possesses characteristics peculiar to itself in its effect upon hide fibre, and in practice it is of course customary to employ combinations of materials according to the results desired. In some experiments made with leather tanned throughout with single materials the greatest tensile strength was found to be in a chestnut tannage, followed closely in this respect by a straight quebracho tannage. Oakwood and hemlock were about equal and strangely enough oak bark gave very poor results in tensile strength of fibre, but in

this respect a straight myrobolan tannage gave the weakest fibre of all the materials tested.

Vegetable tanned hide fibre does not offer much resistance to high temperatures in water, but is not much affected if not exposed too long to its influence, but a low temperature in water if sustained for several hours has a pronounced detrimental effect.

DOMESTIC HIDES AND SKINS

PACKER HIDES

The slaughtering of cattle on an immense scale by the great dressed meat and provision firms of the United States resulted in the systematization of the industry and the output of hides as nearly perfect as is possible in a natural product. Hides and skins are made by nature on the backs of animals, and of necessity differ in size, weight, substance and quality. They are subject to injury from horn and wire scratches, the attacks of insects and branding and in transit from the ranges or feed lots to the stockyards may be damaged by drovers' prods or concussion with each other and the sides of the cars. Many of these contingencies are unavoidable, but it has been found practicable because of operation upon a large scale greatly to reduce the damages incurred through unskillful or careless flaying. The packers have, as nearly as possible, reduced to a science the preparation of green salted hides for the market and hence every detail of their operations should be considered.

Much remains to be done, however, in the Southern States. American steers have increased 57 per cent in value since the beginning of a tick eradication campaign by the Department of Agriculture, in co-operation with the several states. The annual loss in each county ranged from \$150 to \$50,000 before the campaign began, but now are "practically none" or "very

small." The average number of cattle lost yearly in each county has dropped from 895 to 20, or 15.3 to 1.3 in percentage. It is unfortunate that little or nothing has been done or even is projected towards the mitigation of the damage done to hides by grubs. In several European countries vigorous action has been taken by organizations of tanners looking towards the prevention of the cattle grub or warble. The percentage of grubby hides in the United States seems to be larger each year and the evil here is more acute than in countries where remedial measures are enforced.

The beef animal after passing through the usual routine of raising and fattening for market is shipped to the stock yards and sold to a buyer for some killing establishment. All purchases of a given grade of cattle at similar prices are placed in one drove and receive a lot number, which figure is used in designating the various by-products through their course of manufacture. In addition to this lot number, each bullock is numbered consecutively from one up, as killed. These figures are used whenever possible on the various by-products, such as cuts of beef, etc. The system is costly, but beneficial in that errors are avoided and easily traced when made.

The Slaughtering Process.

After the bullock is the property of the killer, it is placed in its respective lot and sent to the slaughter house. Cattle are driven slowly and allowed sufficient time to cool off. If hurried and not permitted to cool, the beef shows bloodshot after being chilled. It is the usual custom to install the killing department on the upper floors of the building, as the cattle can walk up runways and the beef and by-products be sent to the loading platforms by gravity, thus saving considerable expense over the old way of killing on the lower floors and hoisting the beef to coolers above. Each lot is driven to the killing floor in its turn.

Two animals go into each knocking pen, there being usually half as many pens as there are beds for skin-



Edoek is shown pitched on killing floor ready for skinning, with legs already off. The workmen are ripping open the carcass preparatory to pulling out the caul fat and taking off the sides.



ning. An electric prod is used occasionally to hasten beasts which are slow or timid about entering the knocking pens. The "knocker" uses a light sledge fitted with a flexible hickory handle, and strikes each animal a blow on the forehead between the eyes, or more than one blow if the creature does not drop immediately. In most cases the skull is broken by the first blow and the animal loses consciousness and is thereafter dead as far as physical pain is concerned.

When the gate of the movable pen is lifted by mechanical means, the floor also is raised to a sharp angle and the senseless bullock slides to the sticking bed. Sometimes it happens that the bullock is only dazed and recovers its senses enough to regain its feet. Maddened by pain and practically sightless, it rushes around, goring hanging cattle and causing a great deal of excitement. The best way to capture and subdue such an animal is to hamstring it by the aid of a knife fastened on the end of a long pole.

The dead animal is shackled by passing a chain around both the hind legs, although one leg is sufficient. Some packers prefer the latter method, as it allows one free leg, which, by its incessant kicking, helps drain all blood out of the animal. The chain is attached to a hoist and the animal is raised and hung off on a wheeled hook, called a truck, suspended from a rail. The sticker inserts his knife up through the sticking piece in the neck and severs the jugular vein. The cut is made vertically, so as not to mar the pattern of the hide. After the knife is up far enough, it is turned crossways and the vein cut.

The Kosher Process.

When killing cattle for Kosher purposes, according to the rabbinical law, the bullock is not knocked senseless, but simply shackled and the hindquarters raised sufficiently so that just the neck and head are resting on the floor. Then the Rabbi blesses the animal and makes one downward slicing cut with his long knife,

back of the jaw, almost severing the head from the spinal column. The "header" then removes the head, continuing the regular method of killing.

Skinning the Head.

The header sticks his knife in at the top of the head and the cut is made across to the left side of the animal's face. The cut is then continued downward along the left side through the nostril and the hide raised off the face. The cheeks are skinned out and the under side opened from the sticking cut through the center of the lower lip. This leaves the face, or pate, of the animal on the right side of the hide and allows it to lie flat in the packs. The head is then severed from the neck at the top column joint. The horns, if any, are sawed off of the head, which is then taken away to be trimmed. When the header finishes his operation, the animal is still allowed to hang and drain of all blood; usually two or three animals are hanging thus, head downward. Each in turn is lowered to the floor, laid on its back and held in this position by a pritch pole, placed just behind the brisket and foreleg, on either side. The front and hind leggers then take the animal and remove the duclaws and feet, at the same time taking out the sweetbread. The windpipe and weasand are also taken out.

In removing the front feet, cut the cord, which contracts the hoof to an unnatural position, and then make the cut upward on the right side, leaving both duclaw holes on the left side, gradually cutting in toward the center at the knee. Remove the foot at the joint. In the hind legs the same operation is performed, except that the cut from the duclaws to the knee is made in the center, the opening being made with the point of the knife, blade upward. The opening cut, however, is made as in the foreleg and started upward on the right side. The "ripper-open" next follows, opening the bullock from the sticking cut to the tail. The next man to work on the animal has the most important task to perform, as any error or acci-

dent mars the hide or spoils the appearance of the beef by little cuts made with the point of the knife, and termed "black-eyes."

Perfectly Flayed Sides.

The "floorsman," or sider, as he sometimes is called, places his knife under the hide about the middle of the belly, on the side opposite from the pritch pole, and cuts along to the brisket and back to the inside of the hind leg close to the tail, lifting the hide away from the beef. He then makes, failing if inexperienced, a hide of perfect pattern. After cutting down the side of the animal, he makes the cut at the brisket and foreleg, a most important one, as if imperfectly done, too much of the hide is left on the neck, whereas, the most valuable portions are the sides and back. Make the downward cut from the opening in the center of the bullock, far forward, a trifle in advance of the front of the foreleg, lifting the hide and skinning slantingly backwards to the knuckle joint at the rear of the foreleg. On the hind leg the cut is made about three or four inches from the tail, cut being made upward to the back of the hind leg at the knee joint, there connecting with the hind legger's cut.

After completing this side of the bullock, the floorman tips the bullock sufficiently to remove the pritch pole and place it on the other side, so that he can skin out that side of the bullock. The "caul puller" next removes the caul fat and the breast sawyer opens the breast bone. Spreaders are then placed in the gams of the hind legs and the animal is hoisted until only the forequarters rest on the floor. While in this position the "tail puller" pulls the hide off the tail, taking the entire tail bone out. The "rumper" follows the tail puller and cuts the hide away from the base of the tail and the rump.

The bullock is then hoisted to the half hoist where the fell cutters remove the hide from the hind legs, around the "round." Then the fell pullers take the

hind shanks of the hide and pull while the fell beaters pound the hide with the back edge of cleavers. The skin of the animal is very tight in this quarter and the hide has to be pulled off, as knife work should result in a great many damaging cuts and scores. The "gutters" remove the entrails while the bullock is on the half hoist, allowing the government inspectors to examine them for diseases.

Government Inspection

Should the bullock be infected with a disease detrimental to the public health, the entire carcass, or infected quarter, if the disease be local, is sent to the tank to be rendered into inedible tallow. The government's inspectors are all graduate veterinary surgeons and thoroughly capable in this line of work. The "backers" continue the process of skinning by dropping the hide to the shoulders of the carcass. The tail sawyers then insert ring spreaders in the back of the carcass about eight inches from the tail and saw down to this point. The spreaders make this sawing easier than if they were not placed there, something on the order of a wedge inserted in a board by a carpenter when ripping. The splitters sever the carcass into two portions down to the shoulders. This is important work, as improper splitting hurts the sale of the beef. The carcass is then hoisted and hung off on wheeled trucks, so that the forequarters can be worked upon. The hide droppers skin out the neck and forelegs, which thus takes the hide off the carcass. The chuck splitter then severs the carcass into two halves and the scribe sawyer breaks the spinal columns. He uses an arc-shaped saw, set in a heavy block of wood, with a handle on it. His work consists of marking the blade bones and breaking them with a blow from the side of the block of wood in which his saw is set. The breaking of the bones in this manner makes the ribs and chucks look better, as if the beef was of very good thickness with plenty of fat in it.



Endlock is shown on the left hoist with workmen cutting the hide away from the fell and shoulder.

The Coolers.

The carcass after being washed with warm water is weighed, tagged with the lot and bed number and placed in the coolers to chill. The coolers are raised to a temperature of about fifty degrees and are gradually worked down to about thirty-six degrees in forty to forty-eight hours after filling with beef. If the beef is chilled too fast the animal heat has not time enough to escape. After being properly chilled the beef is then loaded in cars and distributed to the wholesale and retail markets of the country. The cattle heads after being dropped on the killing floor are trimmed of meat, lower jaw taken off and brains removed. The feet are cooked to soften the hoofs, which are removed and dried. The shins are sawed at both ends, so as to allow the marrow to cook out. Skulls, jaws, knuckles and shins are placed in vats and cooked to remove the tallow. The entrails are stripped of fat and refuse, turned, washed and salted in respective grades and selections.

Oleo Oil and Oleo Stearine.

The edible fats from the entrails and casings along with the caul fats are chilled in water to remove animal heat and then converted into oleo stock. The edible fats after chilling are hashed and melted. The settlings are drawn off and the remainder in the kettles drawn into trucks and allowed to cool. When ready, the contents of these coolers are placed in cloths, piled in a hydraulic press and put under enormous pressure to remove the oil, termed oleo oil, the product remaining in the cloths being oleo stearine. The stearine is shaken from the cloths, packed in barrels and shipped to soapmakers, compounders and tanners.

Inedible Fats.

The inedible fats from the killing and working floors are sent to the tank house, where they are placed in large tanks and cooked under pressure. The set-

tlings from these tanks are pressed and dried and the tallow put in tank cars or tierces. The blood from the cattle is pumped into large tanks and cooked. Then it is placed in press cloths and put under pressure to remove the tank water. The cooked blood is put through steam dryers to remove the remaining moisture, when it is then fit for commercial purposes.

Selecting, Grading and Salting the Hides.

After the hide is dropped from the carcass, it is spread out on the floor and inspected for cuts and scores. When imperfections are found they are called to the attention of the workman making them. The hides are then thrown into a chute leading to the hide cellar, where they are again inspected for cuts, scores and other imperfections and sorted into the different classes and weights. The ears are split by making one or two cuts through the cartilage. This is done so that they will lie flat in the packs. The different grades of each lot are weighed separately and records kept for shrinkage and stock purposes. The hides, after weighing, are taken to their respective packs according to grades.

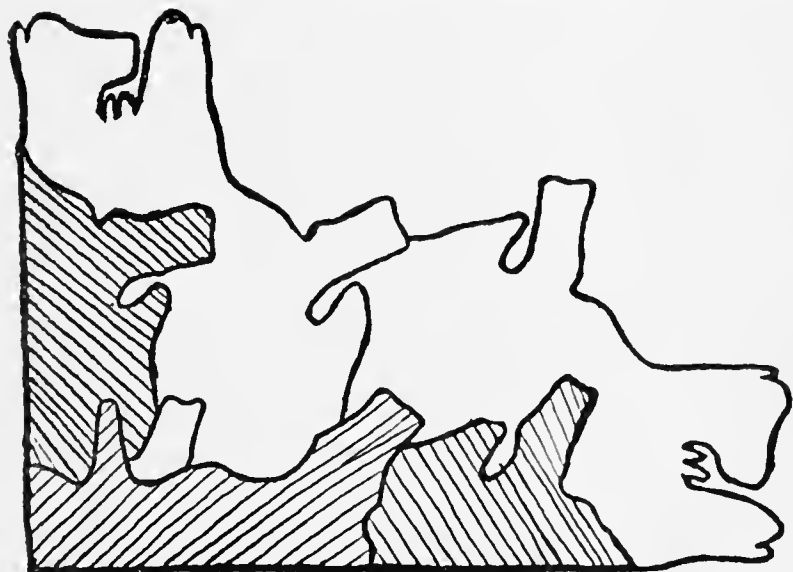
Animal Heat in the Hides.

Workmen in the hide cellar are generally two hours behind the killing gang. This is for the purpose of allowing the animal heat to escape from the hides before they are salted. Two hours is a sufficient length of time to effect this. Usually the following method is pursued: Enough hides are left over from the preceding day's killing to keep the green hide gangs busy for two hours, at which time they can begin work upon the fresh stock. The hides left over night are spread out on the floor in front of their respective packs. If the weather or cellar is warm they are leached out with a little fine salt. During the summer months all hides, whether fresh or held over, are leached in this manner. It is good practice and undoubtedly saves a

great many dollars above the expense of doing this work.

Building the Hide Packs.

Number two rock salt is used in salting packer hides. The packs are built as flat and even as possible, so as to retain the brine. They are also made long and low to accomplish this purpose. This keeps the shrinkage down to a low point and maintains the hides in good merchantable condition. Short high packs show



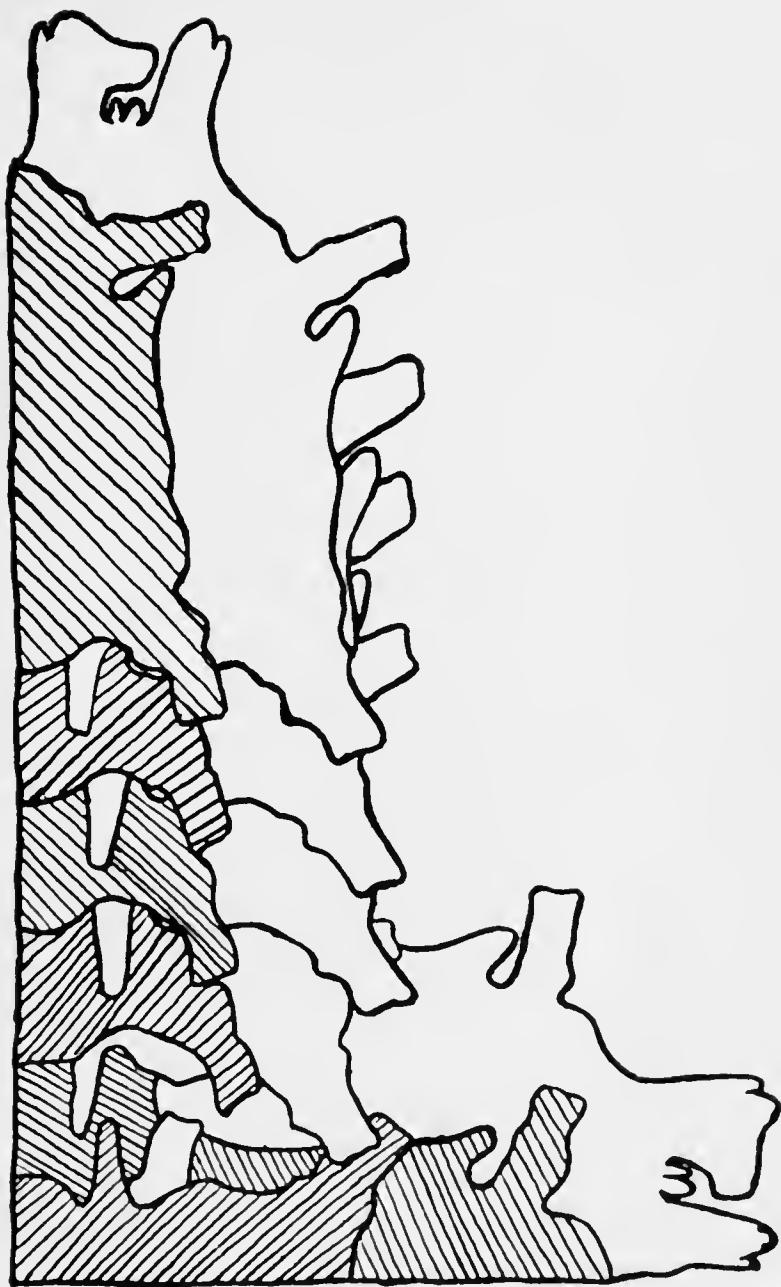
The accompanying cut shows the manner of making a corner on the pack with a butt of a hide. Ruled lines denote hair side of hides.

the greatest shrinkage. To build a regular pack begin an edge at the back of the section selected, folding the hides about a foot from the center, in a line with the outside edge of the neck. First throw some salt on the bare floor, so that the hair sides of the bottom hides will be protected with brine. In making the corners, put in the edge or back spread, leaving the butt of the hide hanging over the edge of the pack.

After salting the forward portion and folding over, turn the butt up as for an edge. Spread out the short

shank, in the corner, diagonally, cover with salt and fold over, being sure that there is plenty of salt in the pocket in the corner. This salt in the corner in addition to curing the hide surface tends to build up the pack, keeping it uniform. The hides are folded over on the edges so that there will always be a sloping surface to keep the brine within the pack and not allow it to run off except by percolation. After the back edge and corners are put in, start at the rear of the pack and make a side edge on each side. When laying the hides down for the edges, put them on close together so as to build up. Place the hides about two feet apart, leaving that much of the hide underneath showing. In addition to putting them close together it is well to allow the hide to sag a little when holding up the outside portion for filling with salt. This allows a lot of salt to fall in this lap, which can be retained there to help build up to outside edge. Fold the hide over, allowing this sag to remain there and then gently pull toward the center of the pack until it is just on the edge. Never try to pull the top flap back, unless the whole hide is pulled with it, and then there is danger of dragging salt off the hide underneath.

After making the back and side edges, the spreads can be put in. In making the spreads the heads of the hides are always placed in the center of the pack. On the side edges the heads are to the front, and in the back and front edges to the center. Corners can be made with heads as well as butts of the hide, but the latter lie best in the pack and retain more pickle. Start the first spread about three feet inside the side edge, commencing at the back of the pack and spread thin for a low shrink and close together for a high one. As a rule the packers leave about two or two and a half feet of the hide underneath showing. When one side is spread, repeat on the other side of the pack. The second spread is then ready to be put in. Place the hides just the same as in the first spread, but put the butts of the hides on the side edges, with tails



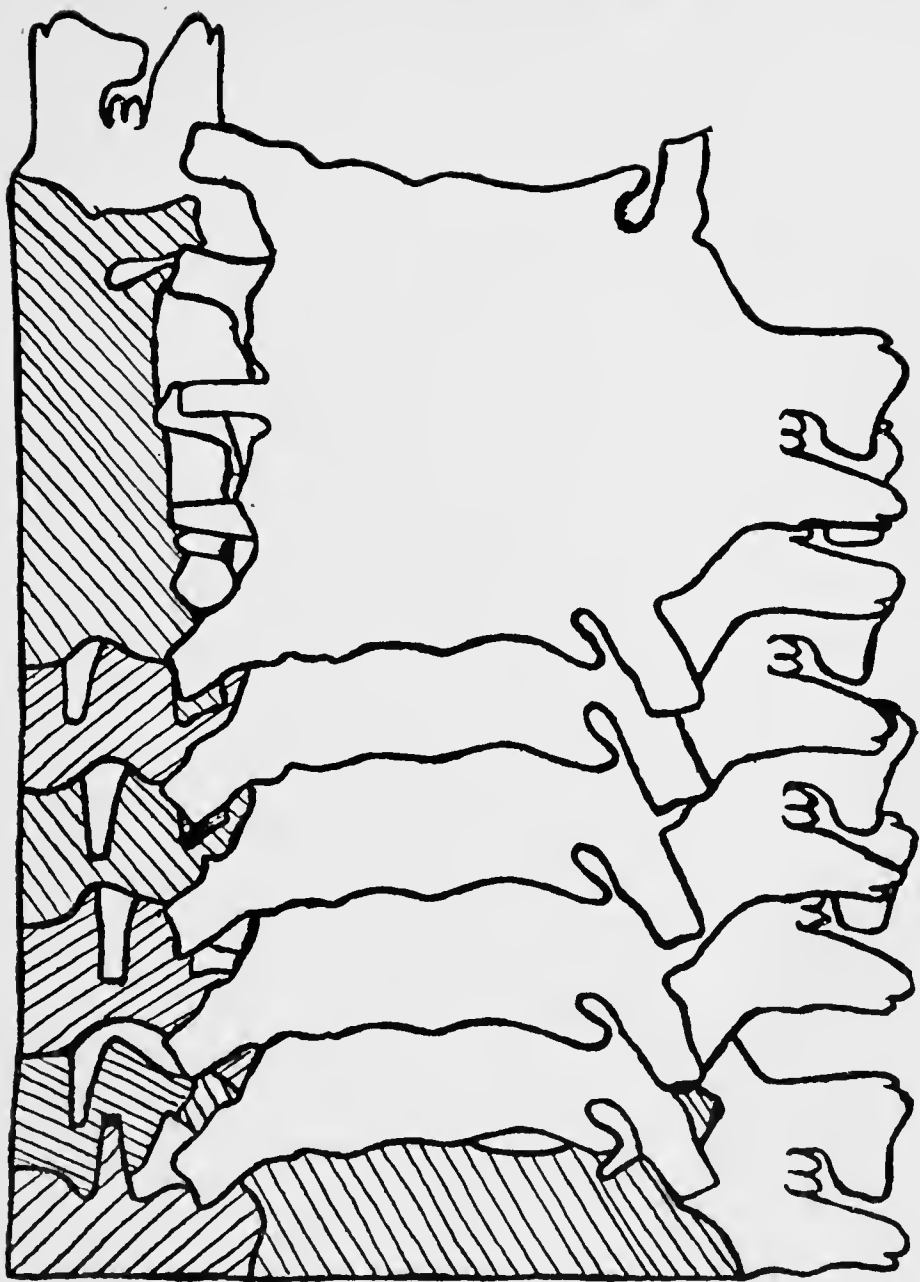
The manner of placing hides on the side edge is accurately shown in this cut. One hide has been left out at the back edge of the pack to show the butt of the hide used in making the corner. The hide left out should be placed the same as the others on the side edge, but at the butt of the pack. After two side edges and the back edge of the pack have been built, the first spread is ready to be put on, as will be shown in the next cut. Hair side of the hides is shown by the ruled lines.

and tag ends turned in and a small quantity of salt under them. When both sides are thus spread, put in the center and last spread of the fill. Heads can be placed either way to fill holes to bring the whole pack up level with the side edges. If there is a deep hole in some spot, throw the head, neck and one shank over into it, or for a small one lay a shank or one side of the head over. See that all ears are spread flat and salted.

All humps in the pack caused by badly split ears or edges and corners of the hide dragged over should be stepped on so that salt grains will adhere to these spots. Never drag hides over a pack, as the salt is carried off and hairslips result. It is best to have two men, one at the head and the other at the butt of the hide, to lift them over to the spot where they have to be laid. The man at the butt of the hide takes the tail in one hand and the shanks in the other, hair side out, while the other workman takes both sides of the head in one hand and the shanks in the other. When the hide is ready to be laid down, the men should drop the lower side of the hide and then turn the upper side over with one motion. The salt on the hides underneath will not be disturbed if hides are handled in this manner. The man on the butt of the hide has charge of building the pack properly. The man on the head of the hide follows his lead in every operation. When the spreads are being put in, the front edge can be built up. Use the spread hides as the front is reached, lapping them over at the front to form the edge, and placing others in to build up even with the rest of the pack. Go through this same performance in subsequent edges and spreads until the pack is completed.

Proper Method of Salting.

For ordinary-sized green hides of about seventy to ninety pounds in weight use a number eight scoop shovel, which holds thirty-five to forty pounds

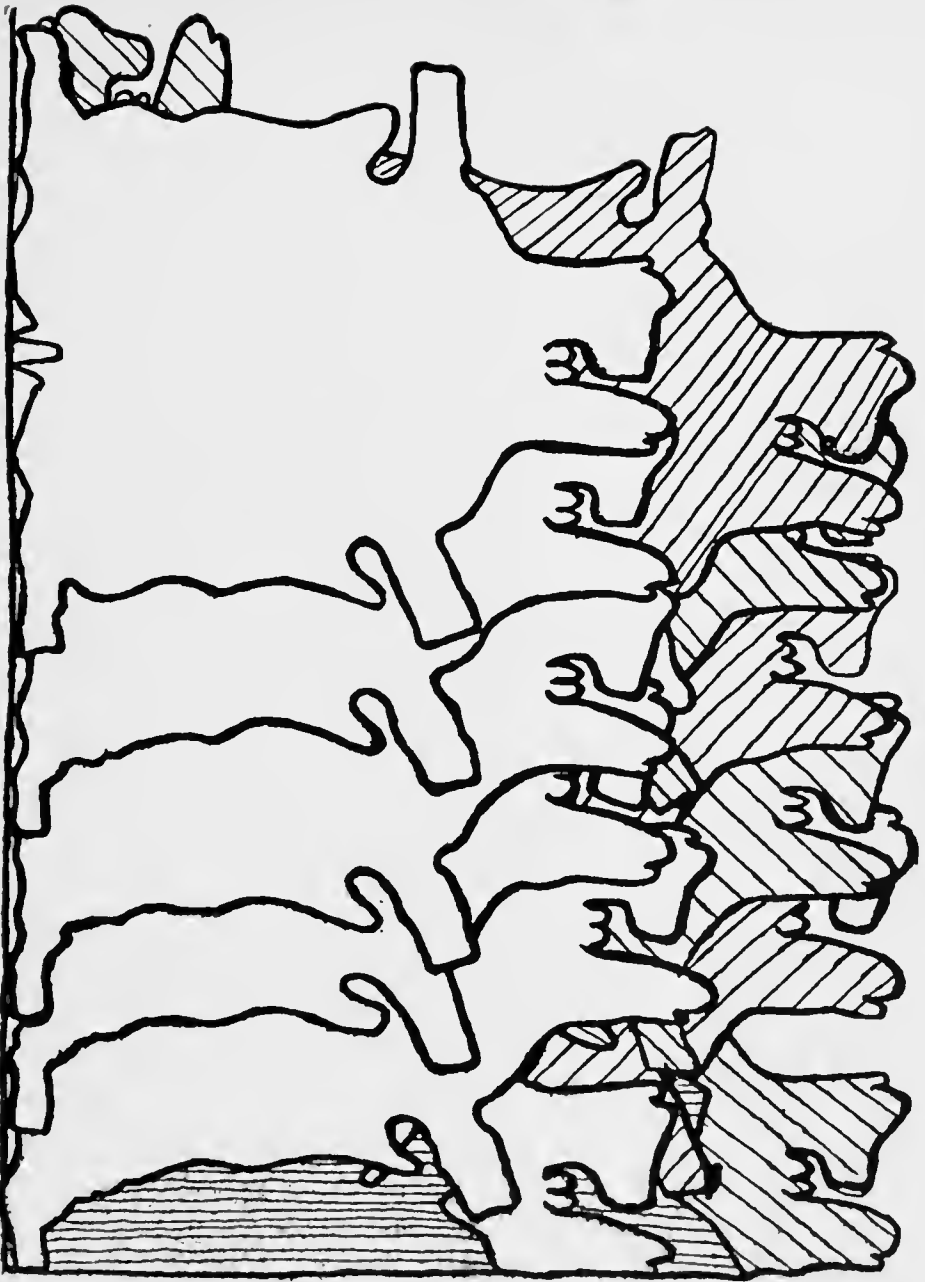


In the accompanying cut, the first spread is shown on the left side of the pack, with the side edge and corner hides showing. One hide had been left out at the back edge of the pack to show the lap on the first hide of the first spread. The hide left out should be placed on top of the hair side of the lapped hide at the back edge. The ruled lines denote the hair side of the hides. Hides are placed in a similar manner along the other side of the pack and second spread put on.

of salt. The old rule of a pound of salt to a pound of hide is a good one to follow. Salt is scattered from the shovel with a sweeping motion, letting the salt leave the shovel at the heel as much as possible. Every square inch of the hide should have a piece of salt on it. Salt throwers become very expert at this work, which is one of the primary reasons that hair-slipped hides are a rarity in packer stock. The longer the pack the less the shrinkage, as there are then a greater number of hides with no folds in them. Every fold is estimated to show a double shrinkage, compared with the same amount of surface unfolded. The hair side of every fold should have salt scattered on it to prevent sticking, heating and hair slips. Low-built packs show a less shrinkage than high ones. from three and a half to four feet is the average height of the packs built by the prominent killers. After the pack is completed put plenty of salt over the top, so that not a particle of the hides is showing. This is to make a brine to keep the top hides moist. The hides in the bottom of the pack are always in the best condition.

A pack that is built in two days will cure quicker and the hides will come up in better condition than one that requires fifteen or twenty days to make, for the reason that the fresh hides going on the pack for the lengthened time are making fresh brine, which goes through the pack and does not give the older hides a chance to get in condition. A pack that is built right and complete in two days will purge in five days and be ready to take up in two weeks, while a pack taking longer to build will not be in condition for delivery for thirty days after closing.

Hides packed in the manner described can be kept without examination for a year or more. With any less salt on them the hides will have to be torn out sooner, as the salt loses its strength in that much less time. About forty per cent of the salt is lost in curing with new salt. Use new salt on hides to remain in



The second spread is placed along the side edge as shown in the above diagram, both sides of the pack being built in this manner. The last spread is then put on, which completes the "fill," the hides being placed with heads one way or another to fill holes. The diagonal lines in the above drawing represent the flesh sides of the hides in the first spread underneath, while the straight lines denote the hair side. As in the cut showing the first spread, one hide has been left out at the back edge of the pack to show the manner of folding the first hide to help build up the back edge.

pack for a long period, so as to avoid rust spots, which are caused by the salt giving out and the decaying process setting in. This will not happen in packs which have plenty of salt to make brine. Old salt, or second salt, as it is generally called, can be used on hides which do not remain in pack for any great length of time. However, it is better to wash this salt thoroughly to get the dirt and small particles out of it. In salting green hides a gang consists of two spreaders, one salt thrower and a salt trucker. Forty hides an hour is the schedule for such a gang. A double gang requires two men throwing hides on the pack, two spreaders, two salt throwers and two salt truckers. These men put down eighty hides an hour. Hides are cured and ready for shipping in two to four weeks, but it is usually four to six weeks before tanners will take them out.

Temperature of the Hide Cellars.

To obtain the best results in curing hides, the cellars should be kept at an even temperature. Hide shrinkages are lighter in cold cellars and heaviest in the warm ones. Expert hide receivers take the temperature of the cellars into consideration when demanding their tare allowance. A cold, damp cellar is to the packer's advantage, while a warm one is distinctly in the hide buyer's favor. A happy medium in the matter of temperature is, therefore, to be desired. As a general rule, the prominent packers endeavor to keep their cellars at about fifty-five to seventy degrees, although sometimes outside cellars register as high as eighty. Brine pipes are usually run through the cellars to keep them cool and uniform the year round. Draughts should be avoided in hide cellars, as the circulating air has a tendency to increase the shrinkages. Some packers have their hides packed on two floors, one above the other, and the hides in the upper floor always are the driest, which, of course, means a higher shrinkage. Hide cellars, as a rule, are on the lower

floors, usually below the ground level, with coolers above, all of which aids in keeping the hides moist and in good merchantable condition.

Cattle Switches.

The switches are cut off of the hides in the cellar at the chute where the hides are inspected by the cellar men. They are trimmed off about twelve to fourteen inches from the butt of the hide. It is not advisable to leave too much of the tail on the hide, as it makes but poor leather, and at the same time too much hide on the hair switch is useless, as it adds unnecessary weight if switches are shipped. Switches are salted with fine salt in one large pile. Put plenty of salt on them, working it into the hair as much as possible. To accomplish this purpose the switches may be wet lightly with a strong brine. Great care should be exercised in salting the switches to prevent their heating. The pile should be looked at frequently and at the first sign of heating should be torn apart and re-salted with new salt. When they are sold they generally go at straight count with the stumps out. This is the usual method in the large packing plants. Some killers, however, sell their switches on a killing count, one switch for every bullock killed, when figuring for payment. This method does away with tedious counting. In the country hide market, where the average weight of hides is lighter, and the switches, therefore, much smaller, they are sold at a fair count, several small switches being counted as one.

Taking Up the Hides.

Taking up hides requires seventeen men to make a full gang. Men who are proficient in this class of work can put up six hundred to a thousand hides, as to grades and selections, in a day. It takes two men pulling the pack, four shakers, two rolling hides, three tying and testing for weights, two to three sweepers,

three piling and one salt trucker. As the pack is built from the rear forward it is torn out from front to the back. The two pack pullers should know how packs are built so that work will not be delayed. The loose salt is dragged to the front of the pack on the hides. The hides are shaken of all salt, the four shakers each taking a corner of the hide and shaking it twice on a frame, called a horse. This horse is a scantling network four by seven feet on legs two and a half feet high and is placed in front of the pack being taken up.

The hides are then dragged over a beaver to remove grains of salt which still adhere to the hide. The beaver is usually made of wood in a triangular shape, higher than it is wide at the base, or it can be made of a hide rolled up lengthwise, hair side out, with plenty of salt in it. The hides, after passing over the beaver, are then spread out on the floor, hair side up, and then turned flesh up and swept of every particle of salt adhering to them. They are also inspected for cuts, scores, hairslips, brands and cows and steers. After rolling up in the respective first and second selections they are tied and tested for weights, heavies, lights and extreme lights.

Taking Out Hides.

In taking out hides, the receiver watches to see that the proper classes and grades of hides are given, surplus salt swept off, number two hides properly marked, manures counted, heavy, light and extreme light hides kept separate and tare and percentage of grubs estimated. Number two hides are rolled up in an opposite manner from the first grade; for instance, the number one hides are rolled up hair out and the seconds flesh out. The reverse is usually the method of procedure, as there are more number one hides. These, when rolled up with the hair in, retain more moisture than if rolled up the other way, keeping the hides in good, workable condition until they reach the tanneries, where they are placed in packs or piled in

bundles. The shrinkage in transit is also less and the grain of the hide is preserved better.

Rolling Hides.

The proper manner of rolling hides is as follows: Throw in the head and neck, even with the front legs, then fold over the belly of the hide on both sides. The fold is not a wide one, just enough to square up the hide nicely. The man at the butt then throws the hind shank lengthwise on this fold and the man at the head does the same with the front shank. Do not throw the shanks under the belly, but on top, as the former method is productive of hair slips, caused by heating, while in the latter procedure there is plenty of air circulating around all parts of the hide. The two men then take one outside edge and fold it in to the center of the back, repeating with the other edge, and then placing these two folds together in one. The butt is then thrown forward beyond the middle and the forward portion of the fold is placed on top of the part already folded, and then the butt is again folded over even with the break in the second lap, thus making a neat bundle which can be tied in a very workmanlike manner. The man at the butt of the hide has charge of the rolling of the hides, the man at the head following his lead, so that the work can be done with speed and neatness. See cut on page 58.

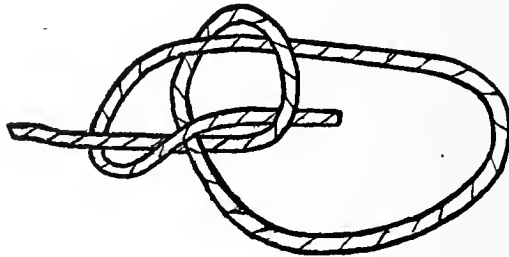
Tying Hides.

When tying hides, ropes about seven feet long are used. A hide knot is tied in one end of the rope. This is the same as a nautical bowline knot, which holds the loop without slipping and at the same time allows the knot to be untied very easily. The man who is tying the hide places the rope under the hide as it lies on the floor crosswise of the last fold and slips the rope through the loop, drawing it taut and dragging the hide over on the round end of the fold. Experts in this line of work give the bundle a sudden jerk, which puts the rope around the whole bundle, permit-

ting of quick tying. The bundle, after being tied tight, is placed in its respective pile.

Hide Ropes.

There are numerous grades and qualities of hide rope, from two-ply sisal to five-ply jute. The two-ply sisal rope weighs the least of any of the others in the uncoiled grade and is also the most expensive. Lightweight ropes are wound into ropes of one hundred strands, while the heavier weight ropes contain only fifty strands to the coil. The ropes come rolled up in a large coil weighing from one hundred and fifty



The nautical bowline knot is used in making the loop on hide strings for tying hides in bundles. The accompanying cut is very clear in showing the manner of making the knot. In tightening the knot, pull the main strand and the end of the string. This knot will not slip and is exceedingly easy to loosen, by bending it until the end becomes loosened.

to two hundred and twenty-five pounds. The strand is unwound as needed and cut up into suitable lengths, about seven feet for heavy hides. The rope, of course, is sold as hide, when weighed up, and for this reason a medium-weight quality is usually selected. One hundred strings of two or three ply sisal rope will weigh about nine pounds, while the heavy jute rope averages about eighteen pounds to a hundred strings. Any rope weighing under ten pounds to the hundred strings is acceptable to the buyers, but they enter a vigorous protest and demand an additional tare if any heavier weight is used. It is only unscrupulous sellers who will endeavor to sell this extra weight in hide rope.

Marking Hides.

Some tanneries have elaborate systems of checking and re-checking results on every car of hides they tan, and for this purpose mark every hide as taken up with a design, figure or mark on the butt of the tail. As a general rule, however, it is only in sample lots of hides that tanners desire the stock marked, as they usually know what returns they can expect on hides they have handled before through the tanneries. The tool for marking the hides is generally a die set in a special hammer head, this being hit with a hammer or the impression made with the die without the aid of another tool. Tanners, by this means, are enabled to identify the hides in a certain carload and watch the results closely through the entire course of manufacturing and selling.

Horn and Wire Scratches.

Packer hides show horn scratches, owing to the class of cattle usually purchased by the killers, but with the improvement of range conditions, horned cattle are being bred out or dehorned. But this improvement is offset by the increase in the number of wire scratches every hide carries. With the dividing of the vast ranges into small farms and ranches, barbed wire was employed by the many land owners in fencing their domain. Barbed wire is a cheap and effective fencing material, but it damages hides to a great extent. One encounter with barbs is usually enough for most cattle, but the grain of the hide always carries the marks.

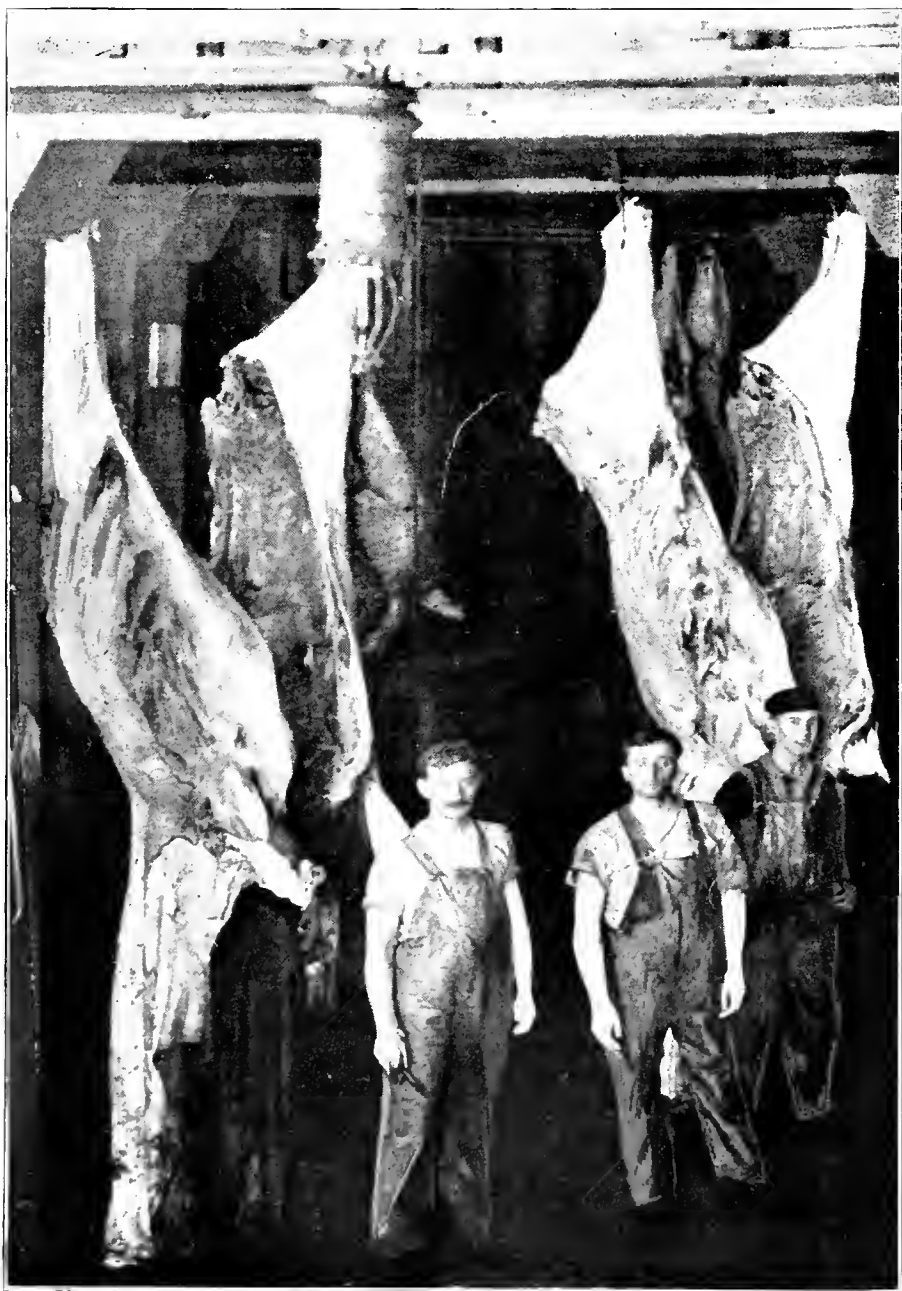
Manured Hides and Tare.

A manure is estimated to weigh three pounds, but if the manured spot is heavier than this, additional manures are counted. The number of manures on a hide is limited only by its size. In selecting for weights, the scale beam is set to allow for a pound test tare. Tare allowance is usually agreed upon between

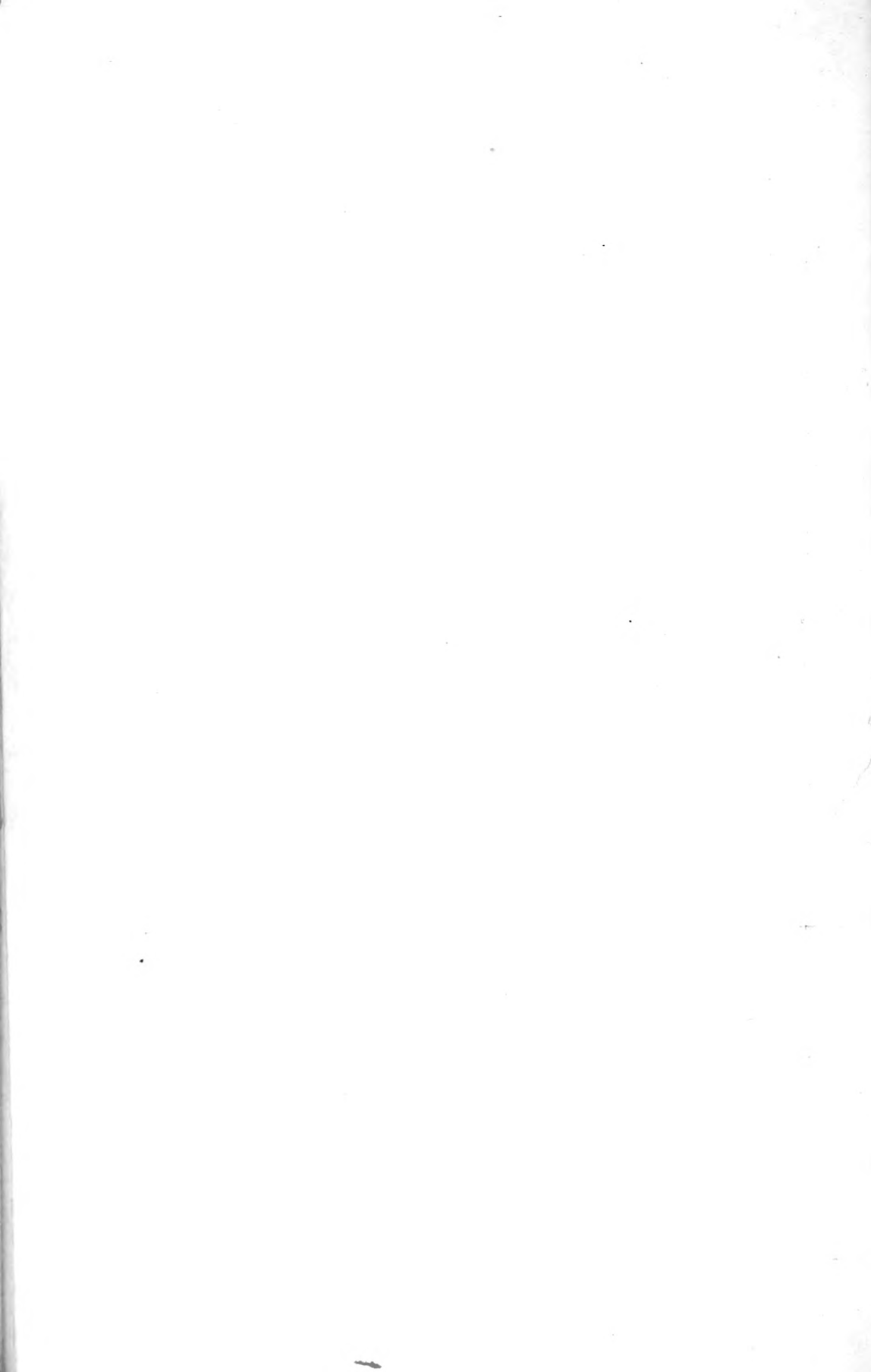
the cellar foreman and buyer's receiver. Some of the packers, however, insist upon a sweep tare. Ten hides are selected, five by the buyer's man and five by the seller's representative. The hides are taken from the pile of bundled hides, which are usually placed in an out-of-the-way place until ready to ship. The bundle on top of the pile is lifted and the one underneath taken for one of the ten hides, and the same method is pursued in getting the other nine, selected promiscuously from the pile. A correct proportion of the different weights is taken. The ten hides are then carefully weighed, opened up and the surplus salt and water swept off. This operation is supposed not to occupy a longer time than two hours. The hides are then rolled up and weighed again, the difference in the two weights being taken as the basis for tare allowance on the car in question. Each carload taken up is treated in the same manner. As a general rule, however, the tare on the car of hides is mutually agreed upon by the buyer and seller, based upon the condition of the hides as they are being taken up.

Grubbing Hides.

The percentage of grubs in a car of hides taken up is generally agreed upon between the cellar foreman and the buyer's representative. However, if an agreement cannot be reached on this question, either party can demand twenty hides for grubbing purposes. The hides are procured in the same manner as for sweep tare. Other methods are also followed. Disinterested parties may pick out the hides or else they can be thrown off of the truckloads as weighed, one from an occasional load. Technically speaking, one grub constitutes a number two hide, as the clear hide is spoiled by the grub hole. However, in the interest of speed and economy, the packers and tanners agree upon the grubbing privilege. The number of hides containing five grubs in the twenty hides selected for grubbing determines the percentage for the car lot in



In this picture the bullocks have been skinned down to the shoulders and the carcass split into two halves. The hide dropper takes the hide off the shoulders, forelegs and neck and the chuck splitter severs the shoulders, making two sides of the carcass. The meat is then run into a cooler and the hide dropped down to the hide cellar.



question. Number one hides only are grubbed. Seconds on a cut selection are already imperfect.

After having grubbed twenty hides, should either party be dissatisfied with the result, they can demand an additional twenty hides for further grubbing. The result of the grubbing of the last twenty hides is considered along with the first twenty in computing the percentage of grubs in the carload. In other words, the percentage of grubs is figured on the whole forty hides grubbed. This can be followed out again, another twenty hides being taken, the grubbing on the sixty hides being final, but it is seldom that even forty hides are taken.

The hides selected for grubbing are spread out on the floor, one by one, as needed, and the receiver's agent proceeds to locate as many grubs as possible, up to five. He cuts the scurf and loose flesh away from the body of the hide with his knife—in New York a spade is used—until the hide surface is clearly exposed. The grubs can then be plainly seen and skewered. When five grubs are found another hide is laid on the floor. Usually, when four, and sometimes three, grubs are found, the remaining one or two are there, if sought for diligently. It is the boast of some expert grubbers that they have never gotten up from a four-grub hide. There are times, however, when five are difficult to locate, even after securing four of them. The time of grubbing is not limited, but it is not supposed to be lengthened beyond a reasonable period for scrutinizing every hide carefully.

Pates and Shanks.

Tanneries which are not equipped to handle offal leathers properly, or do not want to bother with this class of stock, occasionally purchase trimmed hides, pates and shanks off. The packers will trim off the pates or pates and shanks whenever buyers desire this done. Both sides of the head and the ears are taken off with one cut straight across the hide at this point,

and the shanks are removed just above the duclaws. The buyer pays for these trimmings at the regular price of the hides, but later is given a credit, usually of 50c to 85c a hundred pounds for their weight. The packers sell the pates to tanners of offal, or if there is no call for this stock, put them in with the shanks and tag ends and dispose of them as glue stock.

Packer Hide Selections.

Native steers are steer hides free of brands, and are graded in weights, as follows: Heavy hides, above 60 pounds; light hides, between 50 and 60 pounds, and extreme light hides, under 50 pounds and down to overweight kips, 35 pounds cured weights. When steers are sold as killed, the lights go in the lot at one cent less than the heavy price, which is always the basis quoted, and the extreme lights at two cents under the heavy rate. The heavy weights are sometimes sold by themselves, for special leathers, belting butts, for instance; but as a general rule most of the tanners of native steers want light and extreme lights, and the lighter the average the better they like them. The heavies alone are slow sale when offered separately, and for this reason packers generally insist on their going in with the lot. Kosher hides are included in regular lots at $\frac{1}{4}$ c reduction, or, if sold alone, go at value. Native steers are grubbed from January 1 to June 1. Number two hides out at one cent reduction from the respective first selections.

Spready Native Steers.

Spready native steers, when sold as such, are strictly number one stock, free from grubs and all other imperfections. The spread of these hides across the shoulders just back of the brisket is supposed to measure six feet and six inches, in the West, and six feet and eight inches in the eastern markets, where kosher stock is largely killed. Packers usually salt the number one and two spreadies in the same pack, and

the tanner's agent throws out the seconds, which are generally sold separately, at value. Some of the killers will not grade out spreadies in the very grubby season unless there is a very good call for them. Each spready steer hide is grubbed from January to June. Hides with four grubs go as number ones.

Leather from these hides goes largely into furniture and automobile upholstery. Many years ago spreadies brought much lower prices than native steers, as the tanners of regular leather did not want such a thin, flabby hide. Nowadays this selection brings the top price of the list. Kosher spready native steers have to measure six feet and eight inches in the western markets to merit this designation, cured measurements. Allow four inches on green hides for shrinkage to cured measurements.

Of late it has been customary to sell spready native steers covering two periods of the year. They are generally sold January to June kill and June to January kill. The latter selection usually has the best call, for upholstery leathers, while January to June hides are not so suitable for this purpose. They are very grubby in the winter months, and not many are made in this season. Some packers will not grade out spreadies in the grubby period.

Spready native cows are number one native cow-hides measuring six feet and four inches across the shoulders. In the country market this selection is generally graded at six feet and three inches, with some of the dealers insisting upon six-feet-and-two-inch hides going in with the regular spreadies. Number two spready cows are sorted on a one-grub selection in addition to the ordinary second selection for cuts, scores, hair slips, etc. They are sold at value, with seconds a cent less, or at ruling prices if sold alone.

Heavy native cows are also sought after eagerly on account of the good demand for upholstery leathers. The eastern tanners, centered in Newark, N. J., who are the principal users of these hides, come into the

market early in the spring or summer and purchase their year's supply, taking hides ahead for six to eight months. Hides for upholstery leathers have to be choice in quality, and winter hides are therefore unfit for this purpose.

Texas Steers.

Texas steers are branded range steers from Texas, generally, but not necessarily. Their quality for sole-leather purposes is their principal asset. The hide is a narrow one, especially so through the shoulders, and very plump, having a feel almost like sole leather, even when in the green state. The original Texas steer was a long-horned yellow beast, called a "yellow-jacket." This animal was the product of the range, nourished on what little rough stuff he could find growing in those semi-arid sections, and hardy enough to withstand the rigorous winters. His strength went principally to the hide, which protected him in hot and cold weather. Occasionally a few of these "bone-crates" are seen at the "yards," but they are growing scarcer, as, with improved conditions on the ranges, the quality of the beef is raised where formerly scant attention was paid to providing fodder and shelter for stock.

The same weight selections apply to Texas steers as are noted under native steers. In direct opposition to the native steers, heavy Texas sell better than lights, being in good demand for sole leather. Not many of the sole-leather tanneries are equipped to handle light and extreme light weights in tanning. The two latter-named grades sometimes sell at a discount of from a cent and a quarter to a cent and a half from the heavy price, when moved separately or with heavies, as to the state of the market and unsold stocks. The usual one-cent spread is adhered to under normal conditions. On the other hand, this spread may be shortened to less than the usual cent differential due to existing market conditions.

Some "fed stock" pass with the range Texas, but if they show "manures," are generally thrown out, as good Texas cattle have no opportunity to gather dirt. Free-of-brand steers at Texas points are always sold at Texas steers. The grubbing privilege on Texas steers extends from November 1 to June 1. Number two hides go at the usual one-cent reduction from the number one price, of their respective selections, or at value if sold alone.

Butt Branded Steers.

Butt-branded steers have a brand on the rump, generally on one side only, although it makes no difference if there are marks on both sides. The brand must not extend over eighteen inches up from the butt of the hide, otherwise it is a Colorado steer. They are graded in the three weights—heavies, above 60 pounds; lights, 50 to 60 pounds, and extreme light weights, 25 to 50 pounds. The price is graded at the usual one-cent reductions on the lights and extreme lights. It is very seldom that there are any extreme light butts made, they usually going into Texas steers under normal conditions. Whenever any are found they are, as a rule, put right in with the lights at the same price, or thrown out altogether, a good many of the tanneries not being equipped to handle hides under 50 pounds in weight. This selection is more on the free-of-brand order on account of the great amount of clear space on the hide. Butt-branded steers are usually received in quantities at the yards during the winter months, the native season. They are used for purposes similar to native steers in the summer period and go into sole leather in the winter, when they are unfit for high-class leathers requiring choice hides. Kosher butt brands go out at the usual $\frac{1}{4}c$ reduction from the list price of the various grades, when included in regular lots, or at value if disposed of separately. The grubbing privilege extends from Jan-

uary 1 to June 1. Number two hides go out at the usual one-cent reductions from the first selection in the various weights.

Colorado Steers.

Colorado steers are side-branded stock, marked on one or both sides. They are longer through the brisket, producing a greater spread across the shoulders than Texas steers, and have a flabby feel on account of the spongy nature of the hide, due to improved breeding. They are selected for the three weights—heavies, over 60 pounds; lights, 50 to 60 pounds, and extreme lights, 25 to 50 pounds. Very few extreme lights are made, as they go into Texas steers when found. Lights go at the usual one-cent reduction from the heavies, and the extreme lights at one cent under lights, when included with regular lots. As is the case with butt brands, however, very few extreme lights are found, and they sometimes go right in with the lights, at the same price, or else put in with the extreme light Texas steers. Kosher Colorado steers go at $\frac{1}{4}$ c reduction from the list price of regular lots, or at value if moved alone. The grubbing privilege extends from December 1 to June 1. Number two hides go at the usual one-cent discount from number one price in the various weights.

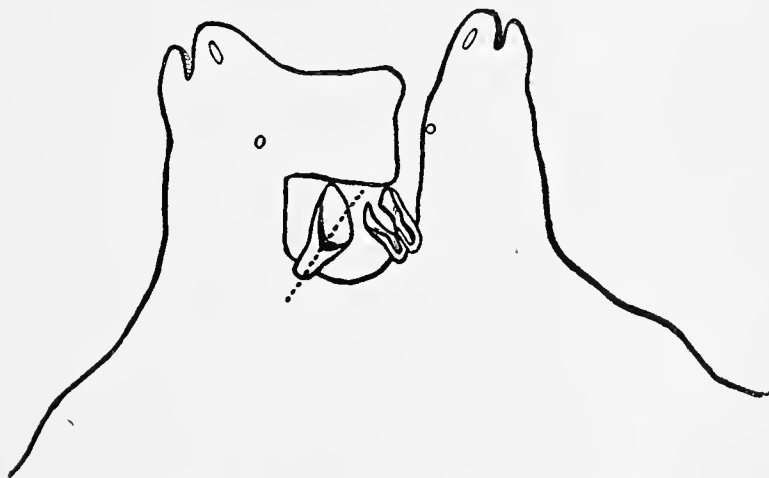
Branded Cows.

Branded cows are simply branded cows. They are not selected for weights, being sold flat in this respect. The average weight is generally much below Texas steers, and koshers are seldom found in this grade. When located Koshers go out at $\frac{1}{4}$ c reduction. As is the case with Texas steers, this selection does not show heavy in manures. It is grubbed from November 1 to June 1. Grubs generally come in early at Texas points and leave early, so that the grubbing dates could very well be advanced thirty

days and still remain satisfactory to all parties. Seconds out at one cent discount from the number one price.

Native Cows.

Native cows are free of brands and graded in two weights; over 55 pounds and under 55 pounds, the former termed heavies and the latter lights. Each selection is sold at value, with seconds at the usual one-cent discount. Three selections are made by some packers when wanted—over 55 pounds, heavies; 45



The splitting of the ears on green hides is clearly shown in the accompanying cut. One cut with the knife is all that is necessary to lay the ear open, so that it will lie flat in the packs.

to 55 pounds, lights, and 25 to 45 pounds, extreme lights. Each grade is moved at value, as noted above. These selections are grubbed from January 1 to June 1, with koshers at $\frac{1}{2}c$ reduction on the heavies and $\frac{1}{4}c$ off on the straight lights, or lights and extreme lights, as to the way they are graded. Extreme lights seldom bring any premium over the straight lights, as the killers generally will not make the 45 to 55 pounds selection unless they can dispose of the extreme lights at the same price. In the country market the weights 25 to 45 pounds are eagerly sought on

account of the good demand for patent leather. These hides are worked into a variety of leathers.

Native Bulls.

Native bulls are free-of-brand bulls and stags, sold flat, as to ones and twos, and not grubbed. Bulls are characterized by their tough pate, thick, ribby neck and thin butt. There are few koshers. Most of the packers will make special selections and weights in this grade, as to tanners' wants. Heavy bulls are sorted at 75 or 85 pounds as to buyers' desires.

Spread native bulls are seldom sorted out by the big packers. Brokers sometimes make this selection themselves, selling the various grades to different tanners. Packer native bulls, spread and narrow, are always sold at a flat price. Spread native bulls measure six feet across the shoulders, just behind the brisket, and are strictly number one hides. They are sold at value with the seconds also at the ruling market price.

Branded Bulls.

Branded bulls and stags are sold flat as to price and not grubbed throughout the year. The southern points of slaughter are in the best demand, as they run lighter in average and more uniform in thickness. They have the tough pate, thick neck and thin butt, but not relatively so prominent as native stock. Mexican bulls are sometimes hard to distinguish from Texas steers for this reason. Native bulls in Texas go as branded. There are few koshers. Light average bulls work well into sole and harness leather.

COUNTRY HIDES

In the United States all domestic green salted hides not taken off at the large packing plants are termed country hides. In many instances they are from the same kinds of cattle which are killed by the packers.

Country hides differ principally from packer stock in that the flaying is poorly and imperfectly done, without any uniform system or pattern. They are seldom delivered out of first salt. Cut, scored and poor-patterned hides are the usual run of country deliveries. The hides originate with the farmers and country butchers, who either salt them a little or sell them green to small country collectors, who in turn put the hides in pack, wetting them plentifully and dispose of them to tanners or larger dealers. As a general rule the tanners decline to operate directly in the country, as they cannot get the selections and weights desired in sufficient quantities.

The larger dealers select the hides purchased in the country into the several weights and grades of steers and cows, branded and native, so that buyers can get almost any selections and weights wanted. Butt-branded hides are included with the natives and kosher stock is sold with the regular stuck-throats, unless otherwise specified by buyers. Cut-throat country hides are subject to a discount of twenty-five cents per hide when so stipulated by the buyer. Country hides, as a rule, receive so many wettings and are resalted with dirty, fine salt so often that they have a dark flesh color and lose a portion of the substance needed to make leather.

The number two selection is effective on hides with cuts, scores, grubs, hairslips or of poor pattern. A hide with a cut near the edge which can be trimmed out without spoiling the pattern is a number one, if so trimmed. Hides with many cuts, scores or hairslips are thrown out as glues and sold at their value. "Pepperboxes," or very grubby hides, also go as glue stock.

In curing country hides, fine salt is generally used. If the hides are salted in small piles, one hide on top of the other, flesh side up, with new, fine salt, they will cure in less than three days, at which time they are ready to be placed in regular packs, but if stock is put in regular packs green, allow more salt and a longer time to cure, say, a little over a week, although less time may do.

As a general rule the hides have the sinews and tail bones left in, with the cheeks in also. The tanners or dealers who purchase these hides have a hard time getting the sellers to trim off this refuse, but the tanners cannot use it and do not have to purchase it along with the hides when buying from the larger dealers.

Country Hide Selections.

Heavy country steers are free of brands over 60 pounds in weight and are sold at value. Seconds go at the usual one-cent reduction. One grub constitutes a number two hide. Every hide in the country market has to be grubbed. There is no grubbing privileges, such as scrutinizing twenty hides as a basis for the percentage on the car. One grub whenever found makes a second-grade hide. Butt-branded steers go in with the natives in the regular grade, unless strictly free of brand stock is specified by the purchaser. Light steers are sometimes sold at one cent discount, but generally are moved alone at value or in buff weights.

Heavy Cows.

Heavy cows are free-of-brand cows over 60 pounds in weight, but sometimes are sold as low as 50 pounds when middleweight hides are slow of sale and heavies in demand. Market conditions govern the price of this selection, with the seconds at one cent discount. One grub whenever found constitutes a number two hide, with the other imperfections also counting in this respect.

Buff Hides.

Bufs are free-of-brand cows and steers 45 to 60 pounds in the Chicago market and 40 to 60 pounds in most of the other hide centers. The great demand for extreme light hides is the cause of the shortening of the weight of this selection in the primary market. No one seems to know exactly the origin of the word buff as applied to this selection of hides, but it is generally thought to apply to the class of leather originally made from these weights, called "buffed stock." The term "light cows" is sometimes applied to this grade, and is directly applicable, as the weights agree with the light selections in the packer hides. The steers in this selection are sometimes sold out and called light steers, 50 to 60 pounds. As a general rule there are not many steers in the buffs, as country butchers slaughter cows principally, while the steers are fattened by the farmers and feeders for shipment to the "yards." There is no custom-made law commanding that the steers be sold along with the cows in buff weights, but they are generally included by the sellers unless there is a good demand for light steers. The number two hides go at a cent a pound less than the sale price when included with regular lots, or at value if disposed of separately. In the winter period seconds, when moved alone, sell at more than the usual cent discount, while in the summer, when the hides are good, some lots go at $\frac{3}{4}$ c under the number one rate. This is largely due to the fact that there are many hides in the lots with one clear side. This can only be done in the summer hair season. Hides with one clear side in former years were sold as the "B" selection and usually went at half a cent under the number one price. This grading was dropped, as the tanners refused to buy it any more, feeling that they would relatively cheapen their purchases by getting them along with the regular number twos. Native and butt-branded bulls under 60 pounds and butt-branded

steers and cows go in with the buff weights. One grub designates a number two hide.

Extreme Light Hides.

Extremes are free-of-brand cows and steers 25 to 45 pounds in the Chicago market and 25 to 40 pounds elsewhere. The heavy demand for this weight of hides by tanners of side upper and patent leather is responsible for the lengthening of the weight selection in this market. When the buffs or middle weights are not in good request this selection is sometimes sold 25 to 50 pounds, making only two selections in native stock, extremes and heavy cows. Seconds go at the usual one-cent reduction from the number one price with regular lots, or at value if moved alone. There is generally a good demand for seconds in all weights for cheap leathers, so that dealers can improve the quality of their regular stock by selling a larger percentage of number ones. In the winter months, however, there are few buyers for seconds. Bulls and butt-branded hides in these weights go right in with the extremes. One grub makes a number two hide.

Kipskins.

Kip skins are free-of-brand cows and steers, 15 to 25 pounds, with bull calves included. Branded and runner kip (runts) are sold at value. Packer skins are sold flat, but on country lots a reduction of a cent and a half is allowed on seconds. Grubby skins go as seconds whenever found. In the winter months this selection is extremely poor in quality and is difficult to move.

Overweight Kipskins.

Overweight kips range at 25 to 35 pounds and are sorted in the regular manner for ones and twos, with the seconds at the one-cent reduction from the first selection. Grubby hides are classed as seconds, or, if "pepperboxes," go out as glues. In the winter season

this selection is undesirable, as the hides are poor in quality and the hair is very long. They are sold at value.

Calfskins.

Calfskins range at 8 to 15 pounds in the country market and in the packer market all skins under 15 pounds, except slunks, are sold as calfskins. Light calf in the country market are sorted at 7 to 8 pounds and deacons at under 7 pounds. They are sold by the piece at value. Deacon skins with a good spread are sorted as light calf. Deacons go at 20c under the light calf rate, which is the governing article for these two weights. Runty packer deacons are generally thrown in the slunk pile. Calfskins are sold at value, with seconds at a cent and a half reduction from the number one price. Packer calfskins are sold at a flat price for ones and twos. The skins are graded into various selections, as to quality. City skins out of first salt are moved separately and outside cities; first salted or resalted are also classed by themselves. Country skins make up the remainder of the divisions, being poorly taken-off stock, meaty and poor in pattern. In the East, calfskins are trimmed, heads and feet off, and sold flat, as to ones and twos, by the piece, at value. In the western markets skins are untrimmed and usually have the tailbone and sinews in. Calfskins come freely during April, May and June and are light in weight. Tanners during these months usually want a heavyweight skin for winter wear, while in winter, when skins are heavier, they want light ones for spring and summer shoes.

Domestic Calfskins.

As a general rule, calfskins are of better take-off than hides. This is occasioned largely by the methods employed in their slaughter and sale. In certain seasons of the year, the packers sell large numbers of calves with the skins on. The skins are taken off the

cold calves by the market butchers in the cities who are proficient in this line of work. The packing house workmen also take off a perfect patterned skin, as the animals are skinned while warm. Country butchers and dealers who make a specialty of this class of work purchase and kill calves, sending them to the cities in the state where killed, owing to the rigorous government inspection laws. These calves are simply dressed, the skin being left on, which is afterward skinned by the city market butchers. A very small proportion of the calfskins in America are of poor take-off and pattern, due to these conditions of slaughter and sale.

In most of the cities rendering concerns call at the various butcher shops daily and collect the bones, scrap meat and calfskins. These collectors in turn salt the skins and usually sell them out of first salt to larger dealers or tanners direct. It will thus be seen that on the average calfskins in America are of good pattern, in excellent fresh condition and suitable for conversion into colored leather.

Slunk Skins.

Slunk skins are unborn calves and are sorted into two divisions, skins with the hair on and hairless. Slunks are sold per piece at value.

Branded country hides have brands on one or both sides of the hide and are sold flat at value, as to percentage of steers included, take-off and condition. It is usually customary to figure $\frac{1}{2}$ c advance for hides out of first salt and bundle condition over packed stock. Branded hides are graded in two weights, under and over forty pounds, light and heavy hides, respectively.

Country Bull Hides.

Bulls, native and branded, are sold separately and at value. Number two bulls go at the usual one-cent discount. The weight selection on this grade of hides is over 60 pounds. Tanners can get heavy or light averages.

Bulls Under Sixty Pounds.

In country hide classifications, a bull hide under sixty pounds in weight is classed as a buff hide. However, certain of the larger tanners who, in a measure, can enforce their demands insist upon all staggy hides being thrown out of the buff weights and sold separately as bulls. These bulls and stags under sixty pounds in weight are much more desirable than the regular bulls over sixty pounds, but are not worth regular buff hide prices. In packer hides, a bull or stag hide is sold as such, no matter what the weight may be.

Glue Hides.

Glue hides are both cows and steers of all weights, sold on the market at value on a flat basis. What constitutes a glue hide is occasionally the cause of much argument. If the hide is tainted, salt-rusted so that the hair slips, very badly grubby (pepperboxes) or very irregular-patterned hides, practically pieces of hides, they are classed as glues.

Horsehides.

Horsehides are sold by the piece, as to size and condition of the butt of the hide. The butts are trimmed off and sold for export for use in boots in Russia, where a thick, non-porous leather is wanted on account of the cold and snow. The nature of the horse butt makes it ideally adaptable for this purpose. Tails and manes are not sold with the hide unless their value is added to the sale price. The hide should be free from cuts, scores, brands or dragged spots, and especially so on the butt for twenty-one inches up from the tail on large hides to merit the number one grade. The butts are trimmed off twenty-one inches up from the tail, the cut being made clear across the hide at this point, taking the two hind shanks as well. The fronts are sold and used in this country for glove

and shoe leathers principally. Seconds, cut, scored and dragged hides go at \$1.00 reduction from the number one price. Ponies, glues and colts are sold separately, by the piece, at value.

Hogskins.

Hogskins are sold flat per piece. These skins are usually badly cut and a strictly number one skin is a rarity unless there is a lot of fat left on it. Butchers generally want to sell as much of the fat with the meat as possible, which is responsible in a large measure for the great number of cuts. Skins clear of cuts across the shoulders are the most valuable, as they are then suitable for pad saddles and other articles requiring a clear piece of hog leather. Of late years, however, these skins have been worked into a variety of leathers, so that the old grading is becoming obsolete. If the skins are badly cut they go out as glues, which sell with the pigskins at half price.

Sheep Pelts.

Sheepskins are taken off the animal by opening the belly, legs and head with a knife, and pulling the skin off the carcass, so as to avoid cutting the pelt. When pulling, the skins are kneaded with the hands, as they will tear if pulled hard. The shanks are generally cut off, as there is no wool on them and they are not needed for leather. The skins are salted liberally with new, fine salt, piled one on top of the other, flesh side up. Piles should not be too high. As they grow in height the slope at the edges increases until the top layers will not hold the salt. After lying for a week or so, according to the quantity of salt used, they are ready to be taken up and shipped. The wool is pulled off the skins and the slat is pickled to keep it in merchantable condition, or else tanned immediately. All grades of sheepskins are saved. Small lambs, known as spring lambs, throw skins about the size of

an ordinary suitcase, but as the animal grows larger the prefix "spring" is dropped and they become lambs until the first clipping, when they are known as shearlings, along with the other shorn sheepskins. After an animal has been shorn it becomes a sheep in stock parlance. During the wool season, skins are graded for heavy and light weights, the dividing line being at 12 pounds green weight. The lightweight skins usually bring about the same price throughout the season, providing the market shows no material change, while the heavy skins become more valuable as the staple of the wool lengthens. Some heavy skins weigh as high as thirty pounds. When the shearing season opens, some lots of sheep are sold to the killers immediately after shearing, and the skins have very little wool on them. They are known as clips and bring a poor price, the slat representing about the only value in them. Sheepskins are always sold at value on the market, the different grades bearing no relation to each other in price considerations.

Dry Hides.

Domestic dry hides are sun or shade dried hides of all weights, cows and steers. They are graded into heavies over 16 pounds; trimmed, heads and shanks off, and untrimmed the full hide and lights under 16 pounds. Skins are sorted under 6 pounds. The seconds sometimes go at one cent reduction, but a flat price is usually paid for both grades. Untrimmed stock sells at a cent under the trimmed rate. Glues and dry salted stock are sold at value. Fallen hides in the above selections generally sell at about three cents under the trimmed heavyweight price, according to the condition of the market. The best hides are taken off by butchers from cattle they slaughter. These are called flint-dried, while murrain hides are known as fallen stock.

GENERAL INFORMATION—PACKER HIDES.

Outside Hide Deliveries.

All of the packers have packing plants at outside points and, therefore, have hides to sell at these places. In order to simplify the buying and at the same time allow a wider field of operations, all hides sold are moved as if sold direct from Chicago. The freight on every car of hides from an outside point is paid by the packer to Chicago, should they go through this market, or the freight is equalized for eastern shipment. Equalized freight means that the difference in rate between the point of origin and the Chicago rate to destination is paid by the packer. In former years all trades were made with Chicago freight allowed from outside points. Some tanners were able to obtain an advantage until the equalized basis was instituted. This latter method of selling hides is universal now. Every tanner who buys packer hides at no matter what point pays freight from Chicago only.

Hide Market Barometers.

Branded cows and extreme light Texas steers usually bring about the same price, with the steers sometimes at $\frac{1}{4}$ c premium, owing to a better demand. Butt-branded steers follow native steer prices up and down throughout the summer months, the native period, but more closely trail the Colorado fluctuations in the winter, when sole leather tanners are the principal buyers. Colorado steers take their cue from light Texas steer prices. Native cows more closely follow the native steers variations and country buff prices in the light weights. Heavy native cows and bulls are ruled principally by the law of supply and demand, which is also the monitor in the other selections, all other rules to the contrary notwithstanding. When certain leathers are in feverish demand, the hides from which they are made rise in price, but the

above guides have been rather closely followed in recent years.

Native and Branded Seasons.

Branded and native cattle come to the stock yards in certain seasons. The native cattle are received in large numbers in the winter months, especially steers from the feeding stations. Native cows are received largely in the winter, when they throw heavy hides principally owing to the long hair and dirt in it, while the light hides predominate in the summer run on account of the short hair and clean condition of the hide. Branded cattle are received mostly in the summer and fall, principally the latter period. Range cattle, after being fed on grass through the summer, are shipped in as fast as fit, and in the fall, up to the first heavy snow, come in large numbers. The first severe storm on the ranges stops the run automatically. Butt-branded steers come in the winter months, along with the fed native steers, as they are on this order of cattle. Colorado and Texas steers and branded cows constitute the run of branded cattle.

Summer Hides.

Summer hides are more desirable, owing to their short hair and consequent reduction in moisture-carrying capabilities, and also to their uniform plumpness, the animal strength going more largely to hide-making than hair. In the winter the animal puts on hair at the expense of the hide substance. The hide itself loses its plumpness and becomes flabby to the feel, the long hair also carrying moisture and manure, on which proper allowance is difficult to agree upon. Cattle hair brings a poor price compared with the cost of it on the hide, and, therefore, long-haired hides are studiously avoided by most tanners. There are certain kinds of leathers requiring choice hides, which qualifications winter hides do not fill. The

long-haired stock is generally turned into sole leather in the very grubby periods, like the February and March killings. The shrinkage on winter hides in transit is much greater than on stock of summer slaughter.

Average Shrinkage.

Packer hides are noted for their almost perfect flaying, the percentage of seconds ranging from half of one per cent to three per cent on ordinary-sized packs. The average shrinkage on summer green hides is about eighteen per cent, and on winter haired stock, thirteen per cent. However, there is one of the "big six" packers who builds his packs in such a manner that at least twenty-one per cent of the green weight is lost in curing in the summer. Shrinkages as low as eight per cent have been obtained with particularly dry green hides put in special packs and delivered with normal tare under favorable conditions. An average yearly shrinkage is about fifteen to sixteen per cent.

Cash and Credit.

All grades and classes of hides are cash commodities and subject to sight draft. This is especially so in the packer market. Some country dealers allow credit of thirty to ninety days to special customers. This practice has become more prevalent of late years. Some of the tanners are well able to pay cash for their raw material, but are endeavoring to buy hides on the same basis as leather is sold, so that they will not have such large amounts of capital tied up in raw stock.

After hides are weighed in the packers' cellars, the weight sheets are sent to the auditing office, where they are figured up and sight draft with bill of lading attached put through the regular banking channels. This is also done in the country deliveries when the terms are cash. When credit is given, a due bill or note is taken from the buyer.

Car Lots and Less Than Car Lots.

Cattle hides and calfskins are scheduled for freight purposes as third class, when shipped by local freight, and as fifth class in carloads. The minimum weight on carloads from the West into Chicago is 30,000 pounds; from the Northwest, 26,000 pounds, and from Chicago east, 36,000 pounds are required to obtain the carload rate. The number of hides considered necessary to make up a carload vary according to the average weights. Packer light native and branded cows are generally shipped a thousand in a car, while six hundred heavy Texas steers are required to make car weight. Five hundred native bulls of heavy average are a carload.

There are no imperative rules governing the number of the various grades of hides required to make carload sales of hides. The quantity is usually specifically stated in addition to the fact that a car is sold. For instance, "A," a packer, sells to "B," a tanner, a carload of butt-branded steers. The confirmation usually states that "one car, 600 hides," is booked to the buyer with usual terms and conditions. The same condition exists in the country market; the number of hides should be specified when buying and selling carload lots alone. Six hundred heavy steers in the country market are supposed to make car weight, the same number of heavy cows, eight hundred buffs, one thousand extremes or fifteen hundred kip skins. From three to five thousand calfskins are loaded into a car, according to the season of the year and average weight of the skins sold.

History of Hide Tariffs.

An examination of all the revenue bills of the United States shows that hides and skins were admitted free of duty for seventy-eight years and were dutiable at various rates and for different periods, amounting in all to about thirty years prior to the enactment of the

Dingley law in 1897. Hides and skins were first taxed August 30, 1842, the object of the bill being to increase the revenues. The vetoes of President Tyler of two tariff bills had caused a treasury deficit, and hides and skins were taxed five per cent *ad valorem*. By the act of March 3, 1857, the tariff was reduced to four per cent. The act of March 2, 1861, put the rate back to five per cent and it so remained until the act of August 5, 1861, when almost everything was taxed to produce revenue to carry on the civil war, and the duty on hides and skins was increased to ten per cent. This duty remained in force until the act of June 6, 1872, when hides and skins were put upon the free list, where they remained undisturbed in any of the general tariff revisions until the Dingley bill, which taxed hides of cattle fifteen per cent, became a law June 24, 1897.

It will be seen from this brief history that hides prior to 1897 were free except during short periods when the government needed revenue, and that the tax was never more than ten per cent and was always made to apply to all descriptions of hides and skins. The Dingley law, therefore, was a new departure in hide tariffs which proved burdensome and oppressive in its operation. It made the duty five per cent more than it had ever been before and taxed cattle hides only, leaving all other kinds of hides and all descriptions of skins on the free list.

The Payne bill became a law August 5, 1909. It restored cattle hides to the free list which had been dutiable since 1897.

GENERAL INFORMATION—COUNTRY HIDES.

General Market Information.

It would be well for the country collectors to consider closely the deliveries which Chicago dealers are compelled to give purchasing tanners in order to move less desirable grades of hides and also the close scrutiny which each hide bears and the attention given by tanners to proper condition on regular lots. Hides delivered to tanners from prominent dealers in Chicago and other centers are practically in as good condition as packer hides, except that they are resalted and not a bright color on the flesh.

Local operators who buy hides from first collectors are compelled to accept purchases under trying conditions if the market is in their favor, but are treated royally and urged to accept more hides than the purchase calls for if the market declines before delivery and is in the seller's favor. Dealers endeavor to keep their trade as much as possible and put up with a good many of these inconveniences to do it. City dealers contend with many small irritations in accumulating stocks of hides which are delivered in a standard manner to tanners at various graded prices.

Reporting the Markets.

The trade papers, while serving a good purpose, are sometimes responsible for some of the inconvenience suffered by dealers. Faulty and incorrect information is published occasionally by some reporting agencies, or enlightening details are hidden when transactions are published which have an unnatural effect upon values. Space is so limited in sheets reporting conditions daily that a good deal of qualifying data must be omitted, under the impression that what is not published is understood by the subscribers. For instance, kip skins are usually quoted in a wide range during the winter months, the inside figure being the

market price for the poorer qualities and the outside figure for the best grades, with intermediate qualities at proportionate values. Other selections are quoted in the same way. When the range is about a quarter or a half a cent, the higher price is usually the one asked for seasonable stock and the inside figure the bid of tanners, the last figure paid or the ruling nominal market.

There also seems to be an impression among some of the subscribers to daily hide market reports that when a sale is quoted at a price—for instance, $10\frac{1}{2}c$ for buffs running fifty per cent seconds—a flat price is meant. This is incorrect. The idea sought to be conveyed is that there was a sale at $10\frac{1}{2}c$, with half of the lot seconds at the usual one-cent discount. Up-to-date reporting agencies always quote the highest grade in the various selections such as number one hides or heavy hides, without qualifying them, while subsidiary grades and selections are properly qualified when quoted. Many matters are mentioned in these reports which are entirely clear to the market-wise, but somewhat vague to the inexperienced reader. To this end it would be well for subscribers to write for specific information governing points in doubt. The information would be cheerfully given and at the same time would furnish an index which would be closely watched in the future, thereby benefiting the quality of the service rendered to subscribers.

Buying Hides Flat.

With the stiff competition for hides among buyers from first collectors and butchers, it has become somewhat of a custom to buy hides on a flat basis in the country. That is, the numbers one and two hides are bought without selection, at the same price. Dealers many times have organized to suppress this custom, but have always been unsuccessful. This method of buying hides puts a premium upon poor flaying, as the farmer or butcher who kills the animal knows that all

the hides will sell at an equal price, whether ones or twos. However, buyers endeavor to buy hides on a relative selected basis, by keeping track of the numbers one and two hides in the previous lots. The buyer who has purchased similar lots before of course has the advantage of knowing about how the hides will run, but buyers with no previous experience will probably pay dearly for their first purchases. This method of buying hides is unsatisfactory to both dealers and first collectors. Dealers are willing and even anxious to buy hides on a selected basis, but butchers decline to do business in this manner, and the competition for hides compels a continuance of the old faulty system.

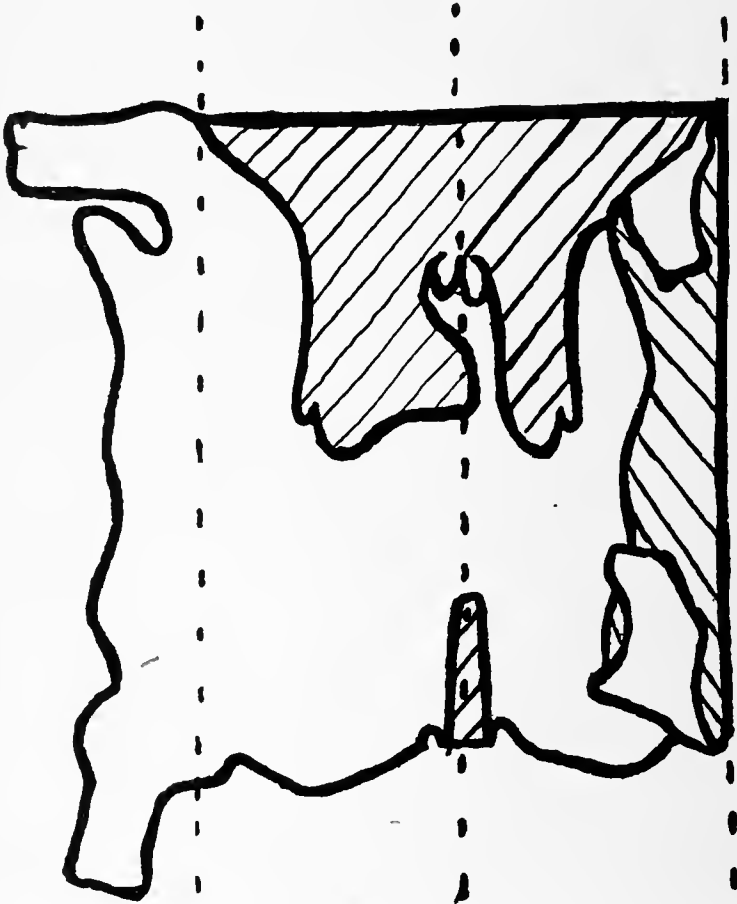
Bundle Condition.

Country hides are sometimes delivered in bundle condition. This is largely true of country branded hides, but the native selections are sometimes delivered in this manner. Bundle condition means that the hides were not placed in packs for wetting and re-salting, but are delivered in the original manner as received from the country collecting agencies. Bundled hides are usually in dry condition and bring a premium over hides which have been repacked and treated in the usual manner. A small tare is allowed on bundled hides.

Influence of the Seasons Upon Packer and Country Hides.

The spread or difference in price between packer and country hides, on account of the superior quality of the former, varies with the seasons of the year and the grades of hides in demand for certain kinds of leathers. For purposes of comparison, country buff hides may be considered with packer light native cow rates. In the summer time, when hides are short-haired, the normal spread between the prices of these two selections is a cent to a cent and a half per pound, while in the winter the difference is about two to two

and a half cents per pound. Of course, this is not invariably followed. Existing conditions of demand have an influence upon prices. There are times when a disparity of over three cents a pound exists between



The accompanying cut shows the correct way to fold hides when bundling. Throw in the head and fold the belly of the hide in, laying the shanks back on the belly. Repeat on the other side and then fold together, as shown by the dotted lines. After this has been done roll the hide into a bundle in three folds. Ruled lines on the cut denote hair side. Hides may be rolled either flesh or hair side out.

these selections. Another fact is that packer hides are sold with the calendar month of slaughter designated. Country hides, however, are not disposed of in this way. These hides are usually three months from date

of slaughter in getting to the primary market. Long-haired country hides continue coming to the Chicago market well into the summer. On the other hand, short-haired hides are received up to and beyond the Christmas holidays. In the spring and early summer, when packer hides are advancing in value, country stock may be stationary or even declining. When packer hides are deteriorating in condition, country buffs may bring almost as much as packer light native cows, owing to the country hides being prime in quality.

Country Selections and Deliveries.

Country hides under normal conditions, when received in the dealers' warehouses, are opened and sorted into the various grades and selections and piled in an out-of-the-way place until sold. Then the selection disposed of is put in a regular pack, being liberally sprinkled with water to add weight and make the hides supple and uniform in condition.

After lying in pack for a day or so, the hides are taken up out of pack and placed in banks. Two men take each hide, one at the head and the other at the tail, folded in the middle, hair side out, and lay them on the floor, piling one on top of the other until there are about a hundred and fifty to two hundred hides in the bank, according to the grade of hides sold. Additional banks are built until enough hides are banked for the next day's work. The banks are usually started late in the afternoon and at the commencement of work the following morning are ready to be taken up. They are spread out on the floor, after shaking over a horse, one at a time, flesh and hair side up, alternately, and selected for ones and twos, the different grades being rolled up, hair and flesh side out, as to selection.

About two to three days are required to deliver a car of country extremes, buffs or heavy hides. The hides are weighed after sorting and then loaded into cars to be shipped to purchasers' plants. Calf and kip skins

are usually banked in large, round piles or over barrels. Sometimes as many as two thousand skins are banked in the large piles, while the barrels will not hold many more than two hundred. After being banked over night the skins are selected. Each skin is examined and thrown in its respective pile, as to grades and selections, and then rolled up in bundles. Kip skins are put three in a bundle and calfskins five in a bundle. Deacons and light calf are rolled up with as many skins as can comfortably be tied up, as they are sold by the piece and have no tare allowance.

The usual tare in the country market is two pounds on bulls, a pound to a pound and a half on buffs and heavy hides, a pound on extremes and a pound to a pound and a half a bundle on calf and kip skins. There is no tare on horsehides or hogskins, these being sold by the piece.

Southern Hides and Cattle Ticks.

Cattle in the southern states of America are afflicted with cattle ticks, which fasten upon the hide of the animal and subsist upon its blood. The ticks make small holes in the hides, which cause the leather to appear peppered with black marks. It is for this reason, principally, that tanners are averse to using southern hides in the native varieties. Southern hides are selected for weights the same as in the Chicago country hide market, but all lots are sold flat as to price of numbers one and two hides. Their value varies as to the section from which they originate, also as to the quality of the flaying and condition of deliveries. These hides originate principally in the territory bounded by the Ohio and Mississippi rivers, being of the least value in the southeastern portion of the United States. Southern hides from the northern sections, along the Ohio River, are the most valuable, as they are less affected by ticks.

The North American fever tick ("margaropus annulatus say") is the transmitter of splenetic or Texas cattle

fever. It is estimated that this pest causes a direct loss of \$40,000,000 a year in the United States. The indirect loss no one can compute. Two peculiarities of this tick should render its control comparatively easy. It is practically restricted to cattle as a host, and it does not fall to the ground for the purpose of moulting. Its failure to exist on other hosts renders it practical to free areas of infestation in a comparatively short time by the simple device of keeping the cattle out. Likewise the dipping or greasing of cattle is a certain and economical method of eradication. The agricultural department of the United States government is making efforts to instruct farmers, and commendable progress has been made.

GENERAL INFORMATION—PACKER AND COUNTRY HIDES.

Grubbing Dates on Hides.

The grubbing privilege on American packer hides commences November 1 on Texas steers and branded cows; December 1, on Colorado steers, and January 1 on all other grades of packer hides. Grubbing ceases on May 31 on all selections.

Price Reductions on Kosher Hides.

All kosher-killed hides sell at $\frac{1}{4}c$ under the price paid for stuck-throat stock, when included with regular lots, with the exception of heavy cows, which go out at $\frac{1}{2}c$ reduction in the packer market. When moved alone, they are sold at value. Country kosher hides generally go out at 25c allowance on each cut-throat hide, when so stipulated in the contract. No reduction on packer kosher bulls.

Measurements of Spready Hides.

Spready hides are measured across the shoulders just behind the brisket. Spready native steers measure six

feet six inches; kosher, spready native steers, six feet eight inches; spready cows, six feet four inches; spready country cows as low as six feet two inches; spready bulls, six feet.

Hide Selections for Various Leathers.

Sole leather can be made from all weights of hides, according to weight of leather desired; usually made from branded hides, although native cows and steers are used when prices are right, usually in the grubby season. Harness leather is usually made from native cows and steers with some butt-branded steers and light bulls utilized occasionally. Upper leather is usually made from light hides under fifty pounds. Kip and calf skins are tanned whole, while heavier weights are split into sides. Patent leather is generally made from extreme light hides of clear grain. Lace leather is made from extreme light hides. Fancy, strap and bag leathers require cow hides, which are split into various thicknesses and weights. Leather belting is usually made from native steers, the butts only being used for high-grade belts. Furniture and carriage leather, from spready hides.

Rules on Tare.

Sweep tare requires the sweeping of ten hides, the difference in the before and after sweeping weights being taken as the tare on the car in question. For instance, ten hides before shipping weigh 680 pounds and after sweeping 560 pounds; the difference, 20 pounds, is the tare allowance; 20 pounds on ten hides, or two pounds a bundle. More usually the tare allowance is agreed upon between buyer and seller when hides are being taken up, when the actual condition of the hides can be observed.

Grubs in Hides.

Grubs or warbles which infest American hides throughout the winter cause great damage. This is

largely due to erroneous impressions of cattle men regarding the operations of the flies and grubs. The fly (*Hypoderma Lineta*, called in England *Hypoderma Bovis*) attaches its eggs by a sticky substance to the hair on the flanks and heels of the cattle. The animal licks the eggs off and many of them are swallowed. The heat of the body hatches the eggs. The resulting grub works its way through the animal tissues slowly, usually breaking through the weasand. By early winter the grub is underneath the hide at the middle of the back and ready to emerge in the spring, at which time they emerge. Cattle and hide men erroneously continue under the impressions that the fly deposits its egg in the hide of the animal at the center of the back and that the larvae lie dormant until spring. Hide men will agree that when the grubs first show in the hides in early winter, they are noticeable, but that it is impossible to punch the hole through with the skewer, showing that the grub works its way to the hide from the inside of the animal.

The flies infest the pastures in dry, warm weather. They create no damage in shaded pastures or those with abundant water for the cattle to wade and lie in. Damp, cool summers are fatal to these flies. In dry seasons their destruction is extremely difficult, as it is only in the larval stage that they can be killed. In the early spring, when the grubs are ready to emerge, they can be extracted by a slight pressure with the thumbs and then killed in a poison solution. In other countries, where these pests are much more prevalent, this subject is receiving serious consideration from trade organizations and by the respective governments.

Small Country Packer Hides.

The United States Government has instituted a rigorous system of inspection and control of the meat packing industry. This has resulted in numerous small packing plants springing up throughout the many states of the Union where formerly severe com-

petition prohibited their establishment. These small plants produce hides of good pattern, well taken off and cured. Many of these small packers take the hides off as carefully as the more prominent killers, and the prices they realize are generally well within the range of the big packer hides, considering that not as many sorts, selections and privileges are given. The take-off and cure of some of the smaller packers can be improved upon. One of the flagrant errors is in not splitting the ears of the hides. When the ears are not split, humps are made in the packs and the salt does not adhere to these spots. Hides in such packs, if left any length of time are liable to show hair-slipped spots. The remedy is so simple and so little extra labor is required, that it must be from lack of knowledge that the practice is continued. One cut through the center of the cartilage of the ear is sufficient to make it lie reasonably flat, while two cuts, judiciously made, will avoid all danger. Care should be taken in making the cuts to avoid damaging the hide surface of the neck with the blade of the knife. Another prevalent mistake is leaving the duclaws on the shanks. One cut when the feet and legs are being skinned is sufficient to remove a duclaw, and aside from the damage to the knife edge, which can be remedied with a few rubs on the steel, nothing is lost by removing them. The eight duclaws on each bullock will not weigh a quarter of a pound, so there is no money to be gained by leaving them on. The tanners prefer hides with ears split and duclaws off. Killers who perform these inexpensive favors have a strong talking point when submitting their offerings to buyers. See cut on page 73.

Suggested Reforms in the Hide Trade.

The tanners of the United States through their national associations have endeavored to rectify the fixed reduction on the second grade of hides. It is the custom in Europe to purchase all second grade hides at a percentage reduction, the fixed rule being ten

per cent less than the rate paid for number one hides. Thus if number one hides bring fifteen cents a pound, the seconds are included at a cent and a half less or thirteen and one-half cents a pound. In America it has been the custom to include all second grade hides at one cent a pound reduction. This was inaugurated many years ago when hides were selling at under ten cents a pound. Within recent years, however, since the scarcity of cattle has become a factor in the tanning industry the cent differential on seconds is declared to be out of line with the foreign markets, where it is possible to obtain a percentage discount on all second grade hides. American hides, within recent years, have averaged between eleven and fifteen cents a pound, in some instances certain selections touching twenty cents a pound. Tanners are agitating to obtain some concession in this matter.

Prominent packers and hide dealers threaten to inaugurate the old "B" selection on hides should tanners insist upon a percentage basis for seconds. In this event almost every second grade packer hide would be put into the "B" class, as they are generally only damaged on one side. Thus if seconds go at a ten per cent reduction the "B" selection would be sold at a five per cent discount. To illustrate: with the first grade of hides at fifteen cents a pound, the "B" grade would bring fourteen and a quarter cents a pound and the seconds thirteen and a half cents a pound. Accepting this view of the case tanners would pay slightly more for damaged hides than under the present system of purchasing.

Arbitrary Grubbing Dates.

Tanners are endeavoring to regulate the grubbing periods. The pronounced scarcity of cattle in proportion to the per capita consumption of leather within recent years has changed conditions in the raw material markets. Formerly it was usual for prominent killers to enter the winter season with practically all

of the previous winter's hides unsold. Tanners, under these conditions, were enabled to purchase the hides of poor quality strictly on their merits, according to percentage of grubs in the months on which no grubbing was allowed and to insist upon large credits for manure and tare. Packers, within recent years, owing to the scarcity of hides have kept closely sold up and ahead on their slaughter. Tanners were forced to take grubby hides on which no grubbing was allowed at full prices. To rectify this, through their associations they have endeavored to institute reforms. Texas steers and branded cows are grubbed from November 1, Colorado steers from December 1, and all other selections but bulls from January 1. In all cases the privilege ceases on the first of June. Grubs noticed early in the Southern markets, due to warm weather early in the year, leave much sooner than in the Northern sections. Northern hides do not show grubby as early as Southern stock and the pests damage the hides for at least a month later than in the Texas selection. Tanners' desires in the regulation of this evil are varied. Some hold that the grubbing dates should be graduated as to the killing points, the same dates to remain in force throughout the middle sections of the United States. Others insist that the period of grubbing should be lengthened two months, one month before and one month after the present dates. Others insist that hides should be grubbed every month in the year, the same as in country hides, one grub to constitute a second grade. Under the present system twenty hides from every car taken up and shipped are scrutinized. This was instituted in the interest of speed and economy, as the clear hide is damaged with even one grub. Every hide in the twenty selected for grubbing in which five grubs are found is a second and from the number found the percentage of damaged hides in the car in question is ascertained. Thus if ten hides have five grubs in them, fifty per cent of the hides, or half the billing weight, is figured at a

cent a pound less. Killers insist that grubby hides are on the order of the "B" grade, as the grubs are only found in the center of the back and as the hide is split the damage is greatly minimized. The grubbing dates and percentage reduction on seconds promised to be a long drawn out affair, with the killers in a position to insist upon the retention of the present rules from the fact that cattle are not being killed in sufficient quantities to keep pace with the demands for leather.

The Brokerage System.

Hides are a cash commodity and are in such condition that claims growing out of condition, selection, delivery, etc., are extremely hard to adjudicate. Their value is so great that it is expedient for purchasers to use every precaution against loss. Tanners whose business is not large enough to employ resident representatives at the hide centers, find it advantageous to buy raw material through reliable brokers. The larger tanning concerns maintain offices and employ experts to watch market conditions and supply the tanneries with stock. Smaller tanners, who endeavor to purchase advantageously, employ brokers. Some of the smaller tanners think it profitable to purchase direct from the slaughterers, and the killers endeavor to encourage this class of buying.

The brokerage system is undoubtedly profitable to tanners, as is evidenced by the volume of sales made under the system. Hide brokers are traders thoroughly familiar with the killers and the market. Weekly market letters to clients contain reviews of recent trading, recount the offerings of the various packers and forecast the probable trend of the market. Close association with buyers and sellers and daily activity in the market make the broker an expert. Clients place their orders with him and are notified of their acceptance.

The closing dates of the various packs purchased are ascertained, and when they have lain in salt a

sufficient length of time, are taken up. The broker employs an inspector in this department, as high-priced hides with proper delivery are generally cheap. The broker's receiver sees that the proper classes of hides are given, all salt swept off, tag ends trimmed, firsts and seconds properly rolled and tied, and an equitable grubbing and tare allowance given. Itemized weights of every truckload of hides are taken and the car is properly sealed, routed and billed. The smaller tanner who deals direct with the killers undoubtedly gets good service, but it would seem from the number of firms doing a brokerage business in hides that their limited remuneration is saved many times over to tanners who deal with them.

Packer Hide Cellar Test.

Observations covering a period of years at the older points of slaughter in the middle West and on the Missouri River have furnished the following compilation of figures, which is self-explanatory. In recent years a lighter weight class of cattle is being killed, which would make a slight difference in the green and cured weights. The appended figures were compiled on all classes and grades of hides, except bulls, both native and branded.

Average weight green, 71 lbs.

Average weight cured, 60 lbs.

Space required in pack, 1.33 cu. ft.

Weight per cu. ft. cured, including salt, 72 lbs.

Average height of pack, $3\frac{1}{2}$ ft.

Salt used in curing, 38 lbs.

Time required to cure, 22 days.

Average shrink, 16 per cent.

Average cost of handling, green, 4c.

Average cost of handling, cured, 4c.

Building Shingled Packs.

In certain of the Eastern hide markets in former years it was the custom of some of the hide salters to

build what were called shingled packs. The hides were lapped over one another like wooden shingles are laid. Salt was first scattered on the floor selected for the pack and one hide was spread hair side down and salted with regular salt. Then another hide was placed on top of this one. About three-quarters of the hide underneath was covered, subsequent hides being placed alternately on each side of the pile, until the pack could be built no higher. The pack when finished resembled a hummock, the outside edges of the hides slanting down much in the same manner as sheepskins are salted in piles. Fine salt was usually used, as rock salt in the coarser grades would not stick on the sloping sides of the pile. The hides purged quickly, as there were no retaining edges to hold pickle and were of a nice bright color. Hides salted in this manner were of so much better quality than ordinary packed stock that a great premium had to be paid for them and tannery results justified the added first cost. This manner of salting has become obsolete in recent years, as too much room was required to build the packs and not enough killers would build packs in this manner to warrant tanners specializing in this class of raw material. Delivery of these hides was much the same as at present, except that the tare allowance was much smaller.

Frozen Hides.

In the northern sections of the United States and all of Canada, during the winter months, frozen hides are produced in large numbers because of the extreme cold. Most of the country slaughtering establishments of the small butchers are unheated and the workmen who kill and skin the cattle devote most of the time to the care of the beef while it is warm. The hides, therefore, receive but scant attention until the more important work is completed. When the butchers turn to the hides, the cold has already acted upon them and some are frozen and others nearly so. Freezing does not injure a hide. The butchers roll

them in bundles and hold them until the arrival of the hide buyers. Frozen hides usually do not have any salt put on them, although some butchers do place some in the bundles. The salt does not have time to take action before the hide becomes frozen. Unscrupulous butchers sometimes place feet, bricks, stones or other refuse within the bundles, knowing that the hides cannot be examined until thawed out, when there is less chance that the deception will be discovered, because of their mixture with other lots of frozen hides.

The thawing of frozen hides is accomplished by placing them close to a stove, but care must be taken that they are not placed too close to the fire, as they will scorch and the burned part will not tan. Some of the larger Chicago hide dealers have specially-constructed rooms in which the frozen hides are placed, no hide touching another, and steam run through coils to raise the temperature of the room. The hides are opened and turned as the thawing proceeds. After thawing, the hides return to the green state, are placed in packs to cure and are handled the same as other country hides.

In collecting these frozen hides from the country butchers, scale weights are taken and an allowance made for shrinkage. The allowance for this purpose is not fixed by any agreed rule, each buyer making the best terms possible. Green hides during the winter months usually shrink about an average of 12 per cent. An allowance of 12 per cent would, therefore, not be out of line, but it is seldom that better than 4 to 8 per cent is granted by the butchers when selling the hides.

Horsehides.

Several conditions are responsible for the difference in quality of summer and winter horsehides. Summer lots contain a great number of hides taken from animals which have died from exhaustion. Usually they are not skinned promptly and lie in the sun

sometimes several days before being attended to. Decomposition is going on all the time. The short hair does not afford protection and dragged spots are often noticeable. A summer horsehide is not as thick or as tough as a winter one. Winter hides result largely from accidental deaths, the cities furnishing most of the hides in this season of the year. In consequence, they are more frequently from large, healthy animals. Slippery pavements cause the most of these accidental deaths. The horses being in their prime the hides are full of life, so to speak, and similar in quality to the hides of cattle taken off in the slaughtering plants. Winter horse hides have a greater thickness than the summer ones and are much tougher. Horses which die in the winter or have to be killed due to serious accidents, do not suffer through decomposition, owing to the cold retarding this condition. Winter and summer hides alike are bought by the piece, but buyers pay as much as 50 cents more for winter hides than summer ones.

Pulling and Pickling Sheepskins.

When the sheep and lambskins are taken off the animals by the killers, they are dropped down into a cool cellar and spread out on the floor and allowed to lie there several hours to permit the animal heat in the skins to escape. After this leaching process is completed, the skins are placed in piles and salted. One skin is placed on the bare floor and salted with fine salt, and others are placed on top, each being salted separately. The number of skins placed in these piles is regulated largely by the seasons. In winter the piles may contain as many as twenty-five to thirty-five skins, while in the summer season, ten to fifteen skins are salted in each pile. Where the cellars are cooled artificially, the number of skins in each pile remains about the same the year round, occasional inspection being required so that signs of heating may be detected.

After lying in the salt for a week or so, the skins are fully cured and are then ready to be taken out and shipped to pulleries. During the summer season great care must be exercised in the selection of cars, if shipment is likely to be delayed in transit, or if the destination is far away. Sheepskins with the wool on heat rapidly, and to avoid this, some pullers insist upon cattle cars being used during the warm weather. Others require the cars to be refrigerators and iced, while others are content with having the side and end doors slightly open and cleated. Some of the large American meat packers have their own pulling establishments and do not perform the salting operation, the skins being taken from the leaching floor direct to the pullery in the green state to be further treated.

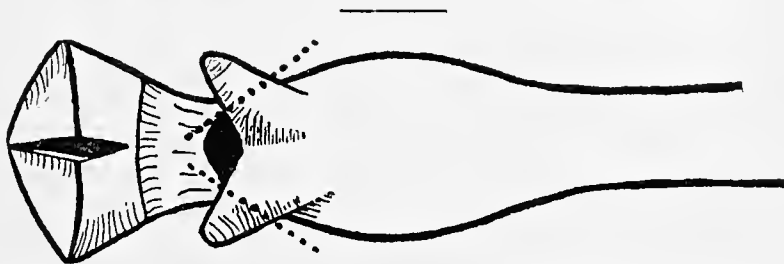
Salted skins when ready to be treated for pulling are placed in vats and barrels containing fresh water. They are allowed to remain in the fresh water from twelve to twenty-four hours in order to remove the salt. When they have become freshened, they are ready to be put through the depilatory process. Green skins direct from the leaching floors of the packing houses are also ready for the depilatory.

The freshened skins and the green skins are painted on the flesh side with a solution of sulphide of sodium. This solution loosens the wool. When the depilatory has been painted on the skins, the flesh side is folded together, either lengthwise or crosswise, and placed in rows and piles to allow the depilatory to take hold on the wool and release it. Other methods are followed. Skins are sometimes hung up in the hot room overnight, which causes the skins to heat, allowing the wool to be slipped from the slat. This is termed sweating. When painted skins have been lying in the piles for a sufficient length of time, from twelve to twenty-four hours, the wool is removed by stripping it over a beam with special hand tools.

The wool from the skins is then dried and sorted

into the various grades and selections, sacked, and is then ready for sale and shipment to the woolen mills. The skins, or slats as they are termed in America, are placed in a paddle-wheel vat to remove the depilatory, limes being used for this purpose. Some pullers advocate immersion in the paddle-wheel vat for about twenty-four hours, the skins then being placed in still-liming vats, where they are allowed to soak from five to seven days, which will effectually offset the action of the sulphide of sodium. Other pullers only put the slats in the still limes, without using the paddle wheel, for a day, but the former process is considered to be the better method.

After the slats have been returned to the fresh state, they are put through the beam house to be fleshed. They are then placed in pickle vats to cure. The pickle is made of a strong brine solution. After being fully cured they are then placed in barrels and the coopered barrels filled with a fresh pickle. In this condition they are shipped to sheepskin tanners, who have to return them to the fresh state before they can be tanned. Pickled skins will keep indefinitely without sustaining any injury from decomposition.

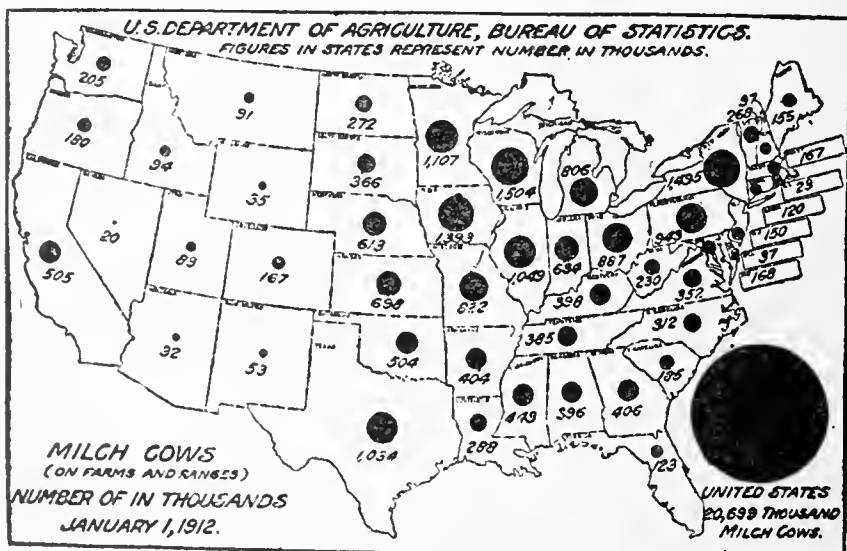
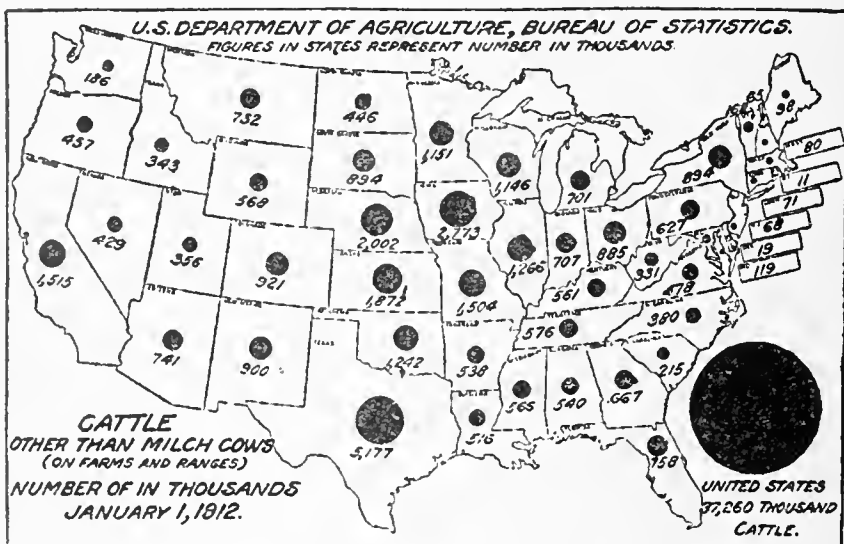


Before the cattle feet are skinned, the dewclaws should be cut off, the dotted lines in the accompanying diagram being fully explanatory. Dewclaws cannot be made into leather and their presence on the hides often causes humps in the packs on which the salt will not lie, thereby causing hairslips.

Black Hides.

Black hides are sorted out in either the country or packer market. The winter season is the period when these hides are the most desirable, as they are wanted

for robes and coats, for which purpose a long-haired hide is desired. This selection sells flat for number one and two hides, practically all being grubby. They are taken, cows and steers together, over 35 pounds, although some coat tanners insist upon a heavier weight average.



ANTHRAX WITH SPECIAL REFERENCE TO SUPPRESSION

By **HENRY J. WASHBURN**, U. S. Bureau of Animal Industry

Nature and History of the Disease.

Anthrax may be defined as an infection due to specific bacilli which may attack every species of domestic mammal, and for this reason may become one of the greatest scourges of animal life. Man is by no means immune, although, fortunately, the malady as it appears in the human subject is usually less acute than the form seen in cattle and sheep. This is probably due to the fact that the lesions in man occur most frequently from infection of the surface of the hands or feet, while cattle and sheep are more likely to swallow the infectious germs with their food, thus giving the germs immediate entrance into the animal system, where they can exert their most harmful influence without check or control.

Historians record an outbreak of anthrax in the south of Europe in 1613 which started with the cattle and spread from them to the populace, ultimately becoming a veritable scourge and causing the death of more than 60,000 people. From this it is very evident that the disease was far more virulent and far more inclined to attack all species of mammals during these earlier centuries than it is at the present day. It is even recorded that many deer and other varieties of game animals were destroyed during these early periods.

At the present time cattle and sheep are the chief sufferers, and the outbreaks appear to be limited to

animals that run upon low, moist lands of a more or less mucky character. In certain regions of the country where the land is mainly hilly, it has been found that pastures exist in which there are wet, low places, and that anthrax appears every season among the cattle of these farms if they are allowed to pasture upon these damp areas, but when good fences are built around them and the stock is kept upon the dry portions of the pasture the disease quickly disappears. Should the fence become broken down, allowing cattle to invade the infected area at certain seasons of the year, they are very likely to contract anthrax. In fact, certain plats of ground of this description have been found to retain the germs of anthrax for several years, a circumstance which has led many investigators to declare that the anthrax organism has the capability of growing from year to year without any artificial aid or cultivation, if only planted upon suitable soil; that it will sprout and grow, producing the plant and later the seed, thus providing a perpetual source of infection for the stock that may chance to be allowed to linger on this area of growing anthrax plants.

Persistency of Infection.

Because of the remarkable tenacity with which certain plots of ground retained their infection, Pasteur in 1880 reached the conclusion that the carcasses of animals dying from anthrax, even though deeply buried, retained their many infectious organisms and supplied them with such an amount of nutriment that they continued to multiply for years, and in this way produced an immense underground supply of virulent anthrax organisms. He decided further that these living infectious germs might be brought to the surface at any time through the agency of earthworms, and that, having reached the surface, they offered a very serious menace to any live stock that might wander into that vicinity. These suggestions were very generally accepted by the medical fraternity and for some years

were taught as illustrative of the manner in which anthrax lurks in certain localities for years at a time; but later investigations by Kitasato have shown that spore formation by anthrax bacilli is very incomplete at a depth of 18 to 20 inches below the surface of the ground, and at even greater depths must be greatly suppressed by the presence of the products of decomposition. Koch has further stated that earthworms are incapable of taking up anthrax spores and bringing them to the surface.

Nevertheless, the fact remains that certain circumscribed areas of ground remain dangerous to stock from year to year. It is still an unsettled question whether the anthrax germs grow and multiply each season upon infected lands when conditions of moisture and warmth become favorable or whether the ground becomes infected at some certain time with bacilli, from which spores develop, which remain near the surface of the ground for years or until taken up by some susceptible animal.

Careful experiments have proven that anthrax bacilli flourish and retain their virulent properties in stagnant water for at least twelve months, and certain authorities claim to have observed them multiplying with no other nourishment than that afforded them by muddy water.

A look at some of the most seriously infected localities in this country will help us to understand the conditions which tend to perpetuate the infection. Upon the rice plantations of the South, where the fields are annually submerged to favor the starting of the rice plants, many of the animals used in the cultivation of the crops contract anthrax and die as a result if driven over the infected lands after the water has subsided and a few days of hot weather have intervened.

Danger in Tannery Effluent.

Where tanneries are located upon or near to streams there is great danger that anthrax will be brought to

them upon hides and then be scattered over the low lands lying downstream from the point where the tanning process is carried on. This state of affairs exists especially near to those tanneries which work upon goat or sheep pelts from foreign countries. Infection in the form of spores adheres to these hides so persistently that ordinary fumigation fails to destroy it, and repeated outbreaks of the disease occur wherever such skins are unpacked and manufactured into leather. In making mention of this danger Professor Law writes:

"Since 1892 anthrax has prevailed along the banks of the Delaware River for a distance of 40 miles in New Jersey and Delaware, destroying from 70 to 80 per cent of the farm stock. The great morocco industry on this river draws infected hides from India, China, Russia, Africa, and South America, and the spores are carried and distributed by the hides."

Delafond studied the vitality of anthrax bacilli in 1860. He placed some blood from a sheep dead of anthrax in a glass container to which free access of air was granted. This was kept in a cool place at a temperature ranging variously from 45 degrees to 60 degrees F. (10 degrees to 15 degrees C.). When examined at the end of the fourth day it was found that the length of the filaments was increased, but that their diameter had remained unchanged. After eight to ten days their length was four or five times as great as when first brought under observation, thus proving that a veritable growth of the bacillus had taken place outside of the animal body and without the presence of animal heat.

In a letter from China to the London Lancet we read:

"The disease which has been destroying cattle throughout this district continues its ravages, though with diminished virulence, probably because there is now a scarcity of susceptible cattle. The mortality has varied from 50 to 75 per cent of the infected animals.

To determine the extent of the disease I made inquiry as to the number of hides exported during the first three months of this year. They say that more than 260,000 left Peking, and that half a million would not be too high an estimate for the whole district. As no cattle are being slaughtered, this represents, approximately, the loss of cattle from the plague.

"The foreign firms that export hides, wool, bristles, and hair are in the hands of Chinese middlemen who roam about the interior buying here and there from the agricultural classes. I have been over some of the factories in Tientsin and have observed the steps they take to clean the stuff before its export. Bristles and hair are thoroughly well boiled in soda solution, wool is roughly carded and shaken free of as much dust as possible by machinery, and hides are sorted out and packed with naphthaline. The exporters claim that any further disinfection than is now given would spoil their goods and increase their expenses.

"The real difficulty does not lie with the *Bacillus anthracis* but with its spores, whose natural resistance is increased by their being embedded in the grease and dirt of the material while it is being dealt with in wholesale bulk in China. There can be little doubt that the passage home through the Indian Ocean and the Red Sea in the warm hold of a ship is all-conducive to their propagation and preservation, so that when the time comes for bristles and hair being carded and separated out by workers at home these spores are liberated in an active condition, ready for human infection to a much greater extent than is the case in China."

Aside from the danger of direct infection to animals pasturing on infected areas, there exists the added danger of inoculation through the agency of hay or other crops that have been grown upon infected areas of land. The process of drying and curing the hay or forage does not lessen this danger, for drying favors the development of spores, and these, mingling

with the dust and fragments of the dried forage, may be taken up by the wind and blown about, or may cause serious damage simply by being eaten by susceptible animals.

Forms of the Disease.

The disease may appear in one of three forms—apoplectic, acute, or subacute.

The apoplectic form is most frequently seen attacking cattle or sheep at the beginning of an outbreak before the animals of the vicinity have developed any degree of natural immunity to the infection. Here the animals present symptoms of cerebral apoplexy. They reel and fall, bloody liquid flows from the body openings, and death soon follows. If the body is opened and search is made for evidence of disease, it may be quite impossible to detect any definite lesions or any change in the tissues.

The acute form of the disease develops more slowly, but becomes well established in twelve to twenty-four hours after the premonitory symptoms are noticed. In these cases the fever is intense (104 degrees to 107 degrees F.). The animal is greatly prostrated. Cerebral congestion causes excitement, which is followed by drowsiness and staggering gait. There is frequent passage of bloody urine, followed by convulsions and death. In this type of the disease, as well as in the apoplectic form, post-mortem examination of the carcass may fail to reveal any definite lesions.

The third form of anthrax, the subacute, is the most common. The symptoms are like those of the acute form except that they are of slower development. Instead of becoming established in twelve to twenty-four hours, one to seven days may be required. The fever is very high. Serious colics are often present. Local anthrax tumors appear externally, first near the shoulders, neck, and head, and are usually due to local injury or bruising, which gives rise to a collection of bacilli within the blood vessels of the part, whose re-

sulting inflammation gives rise to the swellings or carbuncles. These tumors are at first hard and circumscribed, but later become cold, insensible, diffuse and fluctuating. An examination of the carcass of an animal dead of anthrax of the subacute form will probably show many lesions or alterations. Hemorrhages may be found in almost all parts of the body. Serous infiltrations may be present beneath mucous membranes and skin. There will be swelling of the spleen, the liver, and the kidneys, and the blood will be of a muddy or tarry appearance and incoagulable. The cavities of the body contain more or less bloody effusion, and the lymphatic glands are swollen and contain small hemorrhages. The red blood cells have become broken down in large numbers and the serum of the blood has been markedly reddened. The walls of the intestines may appear perfectly normal, but hemorrhages are frequently seen, especially in the walls of the duodenum.

The subacute form is the one most commonly met, and it is the only form which responds favorably to treatment. Death ensues so quickly in the other two forms that attempts at treatment are of but little use.

Isolated or sporadic cases are usually of the subacute form, and are frequently limited to the formation of a tumor or carbuncle at the point of the body at which the infective germs first gained their entrance.

The Anthrax Bacillus.

The anthrax bacillus is a straight rod with ends slightly concave. It can not grow without the presence of air, but will grow in temperatures ranging from 55 degrees to 106 degrees F. It is not capable of motion. It measures 4 to 6 μ in length and about 1 μ in breadth. The bacilli multiply by fission, or dividing into two, or they may multiply much as corn does by the formation of seeds or spores, which sprout and produce a new anthrax plant when placed under suitable conditions. This simile may be carried further, for,

like a tender blade of corn, the anthrax plant or bacillus may be destroyed very easily by the application of heat or cold, but the seed or spore will resist considerable heat and is unaffected by freezing, still retaining its virulence in spite of being subjected to either temperature.

When cultivated artificially and grown in the laboratory, a luxuriant growth may be obtained by planting upon any of the culture media commonly used for bacterial growth. The organisms grow rapidly and produce dense, thick clumps on potato, gelatin, agar, or other solid material. They grow with equal readiness in fluid media such as beef broth, milk, etc., but will not produce spores while growing in media of this character, as spores can not develop except in the presence of free air or oxygen.

Methods of Combating Infectious Diseases.

Whenever attempts are made to control or suppress an infectious disease a thorough study of its character must be made, as the measures to be applied will very largely depend upon the results of such investigation. Take foot-and-mouth disease, for instance. This has become so firmly established in the flocks and herds of certain European countries, especially in the southeastern portion, that it is considered almost an endemic, and while the stock owners are constantly trying to suppress the disease, they never go at it with the fixed purpose of obtaining its complete eradication. But in this country the circumstances are very different. Here the outbreaks have only occurred after long intervals, and in every instance, save one, have been traceable to some definite source. The number of animals attacked in each outbreak has been comparatively small. Hence, in view of the rapid transmission of the infection, not alone by sick animals, but by men, dogs, or chickens that may chance to come in contact with infected cattle or stables, any dallying, experimental measures must not

be considered for a moment; and, taking this view of the matter, the immediate slaughter of all infected and exposed susceptible animals has been insisted upon each time that the disease has appeared within the borders of this country.

Anthrax and Texas Fever.

How very different is the method of dealing with Texas fever. But these differences of treatment are only such as are demanded by the differences in the characters of the two infections. Texas fever is known to be dependent for its origin upon the bite of an infected cattle tick, by means of which the minute parasite which destroys the blood cells of its victims gains entrance to the circulatory system, and multiplying rapidly breaks down so many blood corpuscles that fatal fever quickly results. To obviate this disease, all that is necessary is to keep the cattle free from contact with infectious ticks or to immunize them by the careful application of blood or ticks under proper precautions. Present endeavors of the Bureau of Animal Industry toward the suppression of Texas fever are being extended along these very lines. By establishing and maintaining the Texas fever quarantine line, it is preventing southern cattle from bringing dangerous ticks into northern pastures where their presence would quickly act as a scourge. The Bureau is also doing an immense amount of work in removing all infectious ticks from certain regions of the South, not with a view to saving the cattle of these regions from death from Texas fever, because they have become immune to that disease, but for the purpose of making these cattle more valuable than they are at present, as they may be given free bills of health for shipment to northern points and northern markets just as soon as it can be shown that they originate in tick-free districts.

There are a number of serious contagious diseases which terminate fatally in almost every case of attack. For these no treatment is attempted, but pre-

ventive measures may be applied with the greatest assurance that further spread may be stopped. Such is rabies. Once the disease develops, no known treatment will avail to save the patient's life; but if inoculative treatment is applied soon after the victim is bitten by the rabid dog the chances for recovery are excellent.

In studies of the various infectious diseases it has been found that one of the most desirable means of preventing their extension is to furnish the susceptible and exposed animals with artificial immunity. This is the case with tuberculosis, blackleg, anthrax, rabies, hog cholera, Texas fever and the like. Many animals prove to be naturally immune to these diseases, while others must be made immune by inoculation with suitably prepared materials before they are able successfully to withstand attacks from the specific organisms which cause the several maladies.

Educated investigators the world over have expended a vast amount of effort and study in attempts to discover and perfect the most effective and at the same time the most practicable means of immunizing animals against the more destructive of the infectious diseases. Immense amounts of money have been appropriated for the advancement of these researches, both from governmental sources and from gifts of private wealth. The goal sought by these searchers along lines of agricultural interest is the discovery of some means by which immunity may be conveyed to a large number of animals readily and at slight expense.

Vaccination as a Preventive.

Satisfactory immunity is readily granted to cattle at the present time against the ravages of blackleg or symptomatic anthrax, through the injection beneath the skin of the susceptible animal of some material containing the living but weakened germ of the disease. The amount of this material is so graduated that it causes the prompt development of the very disease that is being guarded

against, but only in a mild and comparatively harmless degree. There is considerable elevation of temperature, and there may even be limited tumor formation, but only in the rarest cases does this type of blackleg, that has been intentionally produced by inoculation, progress so far that the animal is seriously injured. The value of artificially produced immunity in the struggle against this disease is shown by the fact that the losses of young cattle which reached from 15 to 20 per cent in certain infected localities previous to the discovery of vaccine treatment, have been reduced to one-half of 1 per cent at the present time where vaccines are used.

It is at once apparent that hard and fast conclusions cannot be drawn favoring vaccination against anthrax from results obtained in the suppression of blackleg by the use of blackleg vaccine. But there are a sufficient number of points of similarity between the two diseases to justify considering the two together. They are so similar that for many years no distinction was made between the two maladies, but all cases were called anthrax.

The successful vaccination of cattle against either of these two troubles must consist in giving the animal that is to be safeguarded a sufficiently severe attack of the disease that is feared to provide the body tissues with such a degree of resistance that no germs can be taken into the system in fatal numbers and remain to find lodgment and nurture there. After such vaccination the animal is safely protected and can go with perfect safety into fields that would have proven deadly before the vaccination was performed.

Just how this immunity is obtained is still an open question, but it is very manifest that the attenuated organism is able by its growth to affect the tissues (some say the animal cells, others the fluid tissues) in such a manner that virulent organisms of the variety presented in the vaccine cannot possibly thrive, and with-

out the rapid multiplication of virulent organisms within the animal tissues there can be no disease.

Blackleg vaccine is prepared from the affected muscle of an animal dead of that disease. Anthrax vaccine is produced by the cultivation in beef broth of pure cultures of anthrax bacilli, hence may be manufactured in unlimited quantities without having recourse to any animal suffering from the disease.

Pasteur's Experiments.

Starting with a thrifty culture of anthrax bacilli growing in a flask of bouillon, Pasteur, in 1881, by a series of experiments found that subjecting it to a temperature of 108.5 degrees F. for twelve days would so lower the virulence of the organisms that they would only exceptionally cause death when injected into rabbits. Continuing the attenuation by subjecting the bacilli to the same degree of heat for twelve days longer, or twenty-four days in all, he discovered that he had in his possession a living culture of anthrax bacilli that had lost its power for killing cattle, sheep, rabbits or guinea pigs, although still capable of killing white mice. This was the beginning of the practical preparation of anthrax vaccine, for he soon found that cattle or sheep when inoculated with the culture of twenty-four days' attenuation would survive the treatment and would gain a very material power in resisting infection from inoculations with bacilli of a high degree of virulence. This power of resistance is needed to enable them to withstand the injection of the second and stronger vaccine, which, having been subjected to attenuating heat for only twelve days, is possessed of considerable virulence.

In his early investigations he made experiments upon a flock of 50 sheep. Half of these were vaccinated with his attenuated culture of anthrax bacilli. Twelve days later they received an inoculation with stronger vaccine, and forty days after this the whole flock was inoculated with a virulent anthrax culture. Two days

later the vaccinated animals were all sound, while the checks were all dead.

Following this striking demonstration by Pasteur, 60,000 sheep and 6,000 cattle were at once treated in France. The following year the same form of treatment was applied to 270,000 sheep and to 55,000 cattle. Since that time this method of vaccinating against anthrax has found very general application in France whenever losses have occurred, making it evident that certain fields or pastures have become infected with anthrax bacilli. As a result, Nocard and Leclainche state that anthrax has disappeared from many sections in which it formerly decimated the live stock and that the medical doctors at the same time reported a disappearance of malignant pustules from among their human patients.

Immunization.

Soon after this method of immunization by the use of attenuated cultures had become suitably tested and perfected in France, steps were taken to supply vaccinating material to other countries, and reports of its successful application were soon received from Russia, South America, Australia, and other lands.

Other investigators, fearing to use the living anthrax bacillus, even though greatly attenuated, have turned their attention to the production of a serum that should possess immunizing powers equal to those of the attenuated organism. The immunity granted by serum inoculations becomes effective very quickly, but does not last long unless reinforced by the addition of virulent material at about the time that the serum is injected. At first the virulent material was injected a few days after the serum had been applied, but the latest recommendations are that they should be given simultaneously; wherefore it is now customary to inject immunizing serum into one side of the animal's neck and virulent serum into the other side before releasing it.

Very interesting facts have been disclosed through the efforts of various investigators to perfect sera for immunizing in outbreaks of anthrax. It is well known that a very small amount of virulent blood will serve to convey the disease from an anthrax carcass to a healthy animal. A fly can easily carry enough on his proboscis to kill a horse. It may safely be admitted that a single drop is sufficient to cause the death of a horse; yet Sobernheim has, by means of repeated injections, using cultures gradually increasing in virulence, produced such a high degree of immunity in a horse that it withstood the injection into its veins of 500 c. c. (about 17 fluid ounces, or more than a pint) of the most virulent anthrax culture obtainable. This is a good illustration of the word "immunity." It is something that this horse in question has received into his system through the several inoculations of sera that enables him to receive unharmed an injection of living anthrax fully ten thousand times as large as the amount that would have sufficed to kill him previous to his immunization.

Another peculiarity discovered by investigators along these lines is that a culture of anthrax bacilli that has once been attenuated can then be cultivated indefinitely without necessarily causing any alteration in the degree of its virulence. If we let 100 represent the virulence of an active, fresh culture, and 10 the degrees of virulence in one that has been greatly attenuated, it has been repeatedly shown that one can cultivate the attenuated germs for many generations without causing any observable alteration from this virulence rating of 10; yet it only requires the single passage of this material through a white mouse to restore its virulence at once to approximately 100.

Anthrax in Mississippi Delta.

In this country the Delta lands of the Mississippi Valley are most thoroughly permeated with anthrax infection. The losses through anthrax have there

been enormous, due in great measure to the large number of valuable mules owned and worked upon the sugar plantations. Dr. W. H. Dalrymple has for years been engaged in fighting this plague in Louisiana, and he reports as follows on the results of preventive inoculation:

"Perhaps the most convincing evidence of the beneficial effect of this method of prevention in Louisiana is the fact that those localities which suffered most from yearly, or at least periodic, epizootics of anthrax, before vaccination became so generally adopted, have experienced the past summer a wonderful degree of immunity from the disease which, I think, we must attribute to the fact that the use of the lymph is now almost general in these sections and that greater attention is being directed to the more careful disposal of the dead animal, our people more fully appreciating its being the chief source from which this most deadly disease is spread.

"I believe we are gradually solving the anthrax problem in the Pelican State, and the progress we have already made is, I think, considerable and fairly satisfactory when we take into account the enormous and visionary ideas which prevailed up to ten or twelve years ago regarding the true nature of the disease and the most potent factors in causing its spread.

"I question very much if ten years ago a single dose of preventive vaccine was used or an anthrax carcass destroyed as a sanitary precaution against the spread of the disease in our state. To-day there are probably 40,000 or 50,000 doses of vaccine used, and carcasses are being much more carefully looked after, which I feel indicates some progress at least."

The material which Doctor Dalrymple used so successfully and which called forth the above encouraging report was manufactured in accordance with Pasteur's findings and consisted of a double inoculation with attenuated anthrax cultures.

Successful Tests.

In carrying out tests for the determination of the reliability of attenuated living cultures the Bureau of Animal Industry has succeeded in immunizing test animals to such a perfect degree that they were able to withstand subcutaneous injections of extremely virulent anthrax cultures. Cattle, sheep, goats, burros and a mule were subjected to these fortifying inoculations, and were later proven to be immune to anthrax. The first injection caused but slight disturbance of the health of any animal, and only slight elevation of temperature. The second injection resulted in somewhat higher temperatures, and in a few cases in transient indifference to feed. The final test of their immunity was made with a pure culture of anthrax bacilli of the highest degree of virulence obtainable. The application of this severe test soon resulted in very high temperatures and in rather general refusal of feed for a day or two; but this test far exceeded in severity any chance for infection that the animals could have incurred by pasturing over infected lands. Pure anthrax bacilli were forced into the tissues in great numbers, and the ultimate survival and full recovery of the animals after this severe treatment offers the best possible argument in favor of preventive inoculation in all cases in which animals are positively known to be exposed to contact with anthrax bacilli in infected stables or pastures.

The material used in vaccinating against anthrax has many dangerous properties, since it contains living anthrax organisms; hence it should never be used except in regions in which the disease has already appeared, and it should be used only by qualified veterinarians, as careless handling might result in the serious extension of the very disease that it was desired to eradicate. Vaccines for this work should be obtained from reliable manufacturers, as the use of weakened or diluted material can only lead to disappointing results.

The season of the year in which the vaccination is undertaken makes considerable difference in results, for it has been shown that there is a natural tendency toward the suppression of the disease in the infected plats of ground during the winter months.

Other Preventive Measures.

In future attempts to eradicate anthrax from infected districts preventive inoculation will undoubtedly play a very important part. But there are many other steps which should be taken into consideration in addition to the vaccination. Infected areas should be thoroughly drained and kept under cultivation for some time before attempts are made to pasture stock upon them. Sunlight greatly hinders the development of anthrax bacilli, and the repeated stirring of the soil favors the action of the sun's rays.

The complete destruction of all anthrax carcasses is also a very important matter. This is best accomplished by burning, but as this method of disposal is impractical in many localities, deep burial may be practical instead. Covering the carcasses within their graves with quicklime adds another valuable precaution against further dissemination of the infection. No animal dying from anthrax should ever be skinned or cut open, as the blood from such sources is one of the most dangerous means of spreading the infection, being charged while in the animal with great numbers of bacilli, which quickly turn into spores as soon as spread about upon the surface of the ground. All discharges from the body openings should also be burned or buried deeply, as these are frequently of a virulent character.

One of the most common obstacles to sanitary police control of outbreaks of anthrax is the opposition of the owners of the affected animals to any regulation which requires them to dispose in a safe and satisfactory manner the cadavers of animals dying from the disease. Many localities have failed to secure legal

enactments demanding suitable destruction of infectious carcasses, and others which have laws upon their statute books have an opposing public opinion that largely nullifies the real intent and purpose of the law, with the result that carcasses filled with deadly material are allowed to lie about in the fields to be scattered by prowling dogs or birds; or they may be dragged to the nearest stream and thrown into the water, only to be floated along bearing their infection to neighboring properties. A little practical application of the golden rule by interested stockmen would, under these circumstances, not only prove beneficial to their neighbors, but the benefits would be felt upon their own properties in later seasons. It is imperative that all carcasses of animals dying from anthrax should be safely burned or buried if the eradication of the infection is ever to be reached.

There are some encouraging features to be noted in connection with outbreaks of anthrax. One of these is the limitation of the infection to certain restricted areas. Another is that the disease does not sweep across a whole state in a few days, as foot-and-mouth disease is inclined to do. A third is that drainage of the infected parcels of ground usually removes the danger. So let those who have suffered losses of stock from anthrax take courage and resolve to ward it off in the future by fencing, draining, and plowing infected plats, by burning or burying deeply all infected carcasses, and by the vaccination of the healthy animals that are unavoidably exposed. Such methods will lessen the losses and cause the gradual disappearance of the plague.

DISINFECTION OF HIDES

GOVERNMENT DISINFECTION LAW

The revenue law of the United States enacted in 1909 contains the following:

Sec. 12. That the importation of neat cattle and the hides of neat cattle from any foreign country into the United States is prohibited; provided, that the operation of this section shall be suspended as to any foreign country or countries, or any parts of such country or countries, whenever the Secretary of the Treasury shall officially determine and give public notice thereof, that such importation will not tend to the introduction or spread of contagious or infectious diseases among the cattle of the United States; and the Secretary of the Treasury is hereby authorized and empowered, and it shall be his duty, to make all necessary orders and regulations to carry this section into effect, or to suspend the same as herein provided, and to send copies thereof to the proper officers in the United States and to such officers or agents of the United States in foreign countries as he shall judge necessary.

Sec. 13. That any person convicted of a willful violation of any of the provisions of the preceding section shall be fined not exceeding five hundred dollars, or imprisoned not exceeding one year, or both, in the discretion of the court.

The following official circular was issued May, 1910:

Treasury Department, Office of the Secretary,
Washington, May 2, 1910.

To Officers of the Customs and Others Concerned:

In accordance with the recommendation of the Sec-

retary of Agriculture made in pursuance of the act of February 2, 1903 (32 Stat., 791), the following regulations governing the disinfection of hides of neat cattle imported into the United States are issued to take effect June 1, 1910, and will supersede the regulations heretofore prescribed by Department Circular No. 52, of October 20, 1909 (T. D. 30053).

A certificate signed by the American consular officer for the district from which the hides were shipped, showing disinfection by one of the methods hereinafter described, will be required upon the entry of all hides of neat cattle which have not been subjected to a process of tanning, including calfskins and hide cuttings or parings, or glue stock, with the following exceptions, which exceptions will not be made, however, in case of importations from districts where anthrax is prevalent.

1. Hides, whether wet or dry, the product of, and imported from any part of North America.

2. Hard, sun-dried hides, also old and worn-out articles of manufacture, made from raw hides, such as loom pickers and mallet heads, imported as glue stock.

3. Hides and hide cuttings and parings, or glue stock, which have been lime dried after soaking for forty days in a strong lime wash made by slaking quicklime in water and containing sufficient lime to be of a creamy consistency.

4. Abattoir hides, the product of Sweden, Norway, New Zealand, Australia, or Great Britain, when accompanied by a certificate of an official veterinarian showing that the same were taken from cattle free from disease at the time of their slaughter.

5. Hides taken from American cattle killed in lairages in Great Britain.

Methods of Disinfection.

Except in the case of hides shipped from districts where anthrax is prevalent, disinfection by any one

of the three following methods will be permitted, under the supervision of a representative of the consul:

1. By immersion in a 1 to 1,000 solution of bichloride of mercury.

2. By immersion in a 5 per cent solution of carbolic acid.

3. By exposure to the fumes of sulphur dioxide in a room tightly closed in which the hides shall be suspended separately in such a manner that there may be a free circulation of the sulphur fumes and that all parts of the surface of such hides may be acted upon; provided, that there be at least 4 pounds of sulphur burned for every 1,000 cubic feet of air space, and the room shall be kept closed and the hides subjected to the sulphur fumes for at least six hours.

Anthrax.

In the case of hides shipped from districts in which anthrax is prevalent, disinfection by immersion for at least thirty minutes in a 1 to 1,000 solution of bichloride of mercury only will be permitted, and disinfection by such method will be required of all hides of neat cattle and hide cuttings and parings, or glue stock, without exception, imported from any country, when shipped from districts in which anthrax is known to the consul to be prevalent at the time of shipment. Consular officers in districts in which anthrax is prevalent should refuse to certify invoices covering hides for shipment to this country unless such hides are disinfected in the manner above provided.

Certificates of disinfection will be required upon the entry of hides, the product of countries other than those of North America, if imported via ports of such latter countries, and such certificates will also be required upon the entry of hides produced in any part of North America if imported via another country and landed and transshipped in that country.

Hides of a character requiring disinfection under the

provisions of this circular, which are not accompanied by a proper certificate of disinfection, will be treated as prohibited importations and refused entry. Disinfection of such hides on the dock of the importing vessel upon arrival in this country, or their entry for transportation to another country across American territory, will not be permitted for the reason that the landing of diseased hides from the importing vessel or their passage through the United States would tend to the dissemination of cattle diseases in this country.

This circular does not apply to goatskins, sheepskins, or to articles manufactured from the hides of neat cattle.

The regulations herein provided do not in any way modify or affect any regulations under the quarantine laws of the United States.

CHARLES D. NORTON, Acting Secretary.

Disinfection of Fleshings, Hide Cuttings, Parings or Glue Stock.

Amendment of Department Circular 23 of May 2, 1910 (T. D. 30583), relative to disinfection of fleshings, hide cuttings, parings or glue stock.

Treasury Department, September 10, 1910.
To Officers of the Customs and Others Concerned:

In accordance with a recommendation by the Secretary of Agriculture, dated the 13th instant, the Department's Circular No. 23 of May 2, 1910 (T. D. 30583), is hereby so amended as to no longer require the production of certificates of disinfection upon the entry of fleshings, hide cuttings, and parings, or glue stock, when the same is shown by the consular invoice used upon entry or by a consular certificate, to have been lime dried, after soaking for forty days in a strong lime wash made by slaking quicklime in water and containing sufficient lime to be of a creamy consistency, or to consist of glue stock which has been dried by exposure to the action of the sun and air for a sufficient time to render each piece of the hardness

of a sun-dried hide, provided that a certificate in proper form is filed with the American consul by the exporter showing that none of the products shipped were taken from animals affected with anthrax.

It is the purpose of this amendment to permit the entry of glue stock of the character above described when imported from any country or district notwithstanding the limited prevalence of anthrax therein, without requiring the same to be disinfected in the manner prescribed by the said circular.

CHARLES D. HILLES, Assistant Secretary.

Disinfection of Hides.

The exception in Circular No. 23 of May 2, 1910 (T. D. 30583), relative to abattoir hides, extended to include such hides, the product of Denmark.

Treasury Department, December 6, 1910.

To Officers of the Customs and Others Concerned:

In accordance with the recommendation of the Secretary of Agriculture the following regulation in T. D. 30583 (Circular 23) of May 2, 1910, is hereby extended so as to include in exception four abattoir hides, the product of Denmark:

A certificate signed by the American consular officer for the district from which the hides were shipped, showing disinfection by one of the methods hereinafter described, will be required upon the entry of all hides of neat cattle which have not been subjected to a process of tanning, including calfskins and hide cuttings or parings, or glue stock, with the following exceptions, which exceptions will not be made, however, in case of importations from districts where anthrax is prevalent.

4. Abattoir hides, the product of Sweden, Norway, New Zealand, Australia, or Great Britain, when accompanied by a certificate of an official veterinarian showing that the same were taken from cattle free from disease at the time of their slaughter.

JAMES F. CURTIS, Assistant Secretary.

Disinfection of Glue Stock.

Treasury Department, October 28, 1911.

To Officers of the Customs and Others Concerned:

The Secretary of Agriculture advises the department that it has been represented to his department by a delegation of glue manufacturers of this country that the material in which they are particularly interested, so far as the regulations in connection with disinfection are concerned, consists of dry limed fleshings, which material is scraped or shaved from the inner surface of limed hides or hides which have been subjected to a liming process principally for the purpose of depilation preparatory to tanning.

The Secretary states that it would appear, therefore, that the fleshings removed from the inside of the hides, like the hair which is removed from the outside during this processing, should be exempt from the disinfection requirement as applying to hides of neat cattle under the provisions of T. D. 30583 and the amendment thereto, T. D. 30913, and he requests that the Secretary of State be asked, in view of the character and treatment of this material, to instruct the American consuls at Madras and other foreign ports at which dry limed fleshings are accumulated or are hereafter offered for shipment, to permit the same to come forward, until further notice, without disinfection and without certification other than that such shipments consist exclusively of dry limed fleshings. The opinion is expressed, however, by the Secretary of Agriculture that this exemption should not apply to cuttings or trimmings from the edges of hides, or pieces of hides, which represent the hide in its full thickness or entirety, as such cuttings or trimmings should be subject to the same requirements as the hides themselves.

The Secretary of State has this day been requested to instruct the consular officers concerned in accordance with the foregoing.

T. D. 30583 and 30913, of May 2 and September 10, 1910, respectively, are, therefore, hereby amended accordingly. JAMES F. CURTIS, Assistant Secretary.

Disinfection of Glue Stock.

Treasury Department, January 18, 1912.
To Collectors and Other Officers of the Customs:

Referring to the opinion of the Secretary of Agriculture, published in T. D. 31960 of October 28, 1911, that cuttings or trimmings of hides contained in shipments of dry limed fleshings should be subject to the same requirements as the hides themselves, that officer states that his department has been informed that the American consular officer at Madras, India, refuses to allow dry limed fleshings to come forward on account of containing a few pieces of dry limed hide cuttings or trimmings.

The secretary states that a limited amount of these dry limed trimmings mixed with the fleshings is not objectionable, as they are trimmed from the same hides as the fleshings during the processing which they receive prior to tanning, and he requests that the Secretary of State be asked to instruct the American consular officers at Madras and other ports at which dry limed fleshings are accumulated, or are hereafter offered for shipment, to permit such fleshings to come forward until further notice without disinfection or certification other than that the fleshings are dry limed.

The Secretary of State has this day been asked to instruct the consular officers in accordance with the request of the Secretary of Agriculture.

A. PIATT ANDREW, Assistant Secretary.

PROGRESS AND PROSPECTS OF TICK ERADICATION

By COOPER CURTICE, D. V. S., M. D.

The southern portion of the United States has long been afflicted by the presence of the cattle tick *Margaropus annulatus*. These ticks spread the infection of the disease known as Texas fever of cattle and often infest cattle so numerous as to stunt their growth and seriously affect their condition. Their presence necessitates a quarantine under which cattle from the infected regions may be shipped to other parts of the country only under certain restrictions and for immediate slaughter. The ticks also largely prevent the introduction and breeding of fine stock. The damage and losses caused by these parasites are enormous, being estimated at from \$40,000,000 to \$200,000,000 a year.

Systematic cooperative work by the Federal Government and the affected States for the eradication of these ticks has now been in progress nearly five years, and it is opportune to pause and look over the field to ascertain what has been accomplished, what obstacles have been encountered, and what may be done to assist in the further prosecution of the work.

The Beginning of Tick Eradication.

At a meeting of the commissioners of agriculture of cotton-growing States held in Raleigh, N. C., in 1899, the Hon. S. L. Patterson, commissioner of agriculture of North Carolina, directed the writer to present the aim of that department in improving the cattle industry by tick eradication. From this beginning until 1906 twelve counties in that State had been

released from quarantine and fifteen mountain counties had been permanently protected from the hitherto perennial threat of a federal cattle quarantine. The commissioners' association and various allied organizations, influenced by the eradication work of North Carolina and the results obtained by Federal, State and other investigators, together with the growing necessity of ameliorating the effects of the boll-weevil invasion, prevailed upon the United States Congress to make an appropriation in 1906 to empower the United States Secretary of Agriculture to inaugurate a plan of cooperation with the authorities of Southern States in the eradication of the cattle tick. The Federal appropriation for the fiscal year ended June 30, 1907, was \$82,500, and for 1908, \$150,000. Annually since then \$250,000, a sum sufficient to meet the advances of those States interested in the work, has been appropriated. It is probable that succeeding Congresses will continue to meet the demand for future cooperation in the degree that States show real interest and actively engage in tick eradication.

In 1906 there were fifteen States more or less infested with cattle ticks. These contained 929 counties that were quarantined to prevent the cattle from carrying the ticks into uninfected territory. While preparing to cooperate with the Southern States, the Chief of the Bureau of Animal Industry, to whom the Federal work had been assigned, ascertained that but seven States had laws which would enable the bureau to cooperate with them. Work was begun in these, viz.: Virginia, North Carolina, Georgia, Kentucky, Tennessee, Oklahoma and California. Since then other States have enacted laws and undertaken cooperation, notably South Carolina, Alabama, Mississippi, and Arkansas.

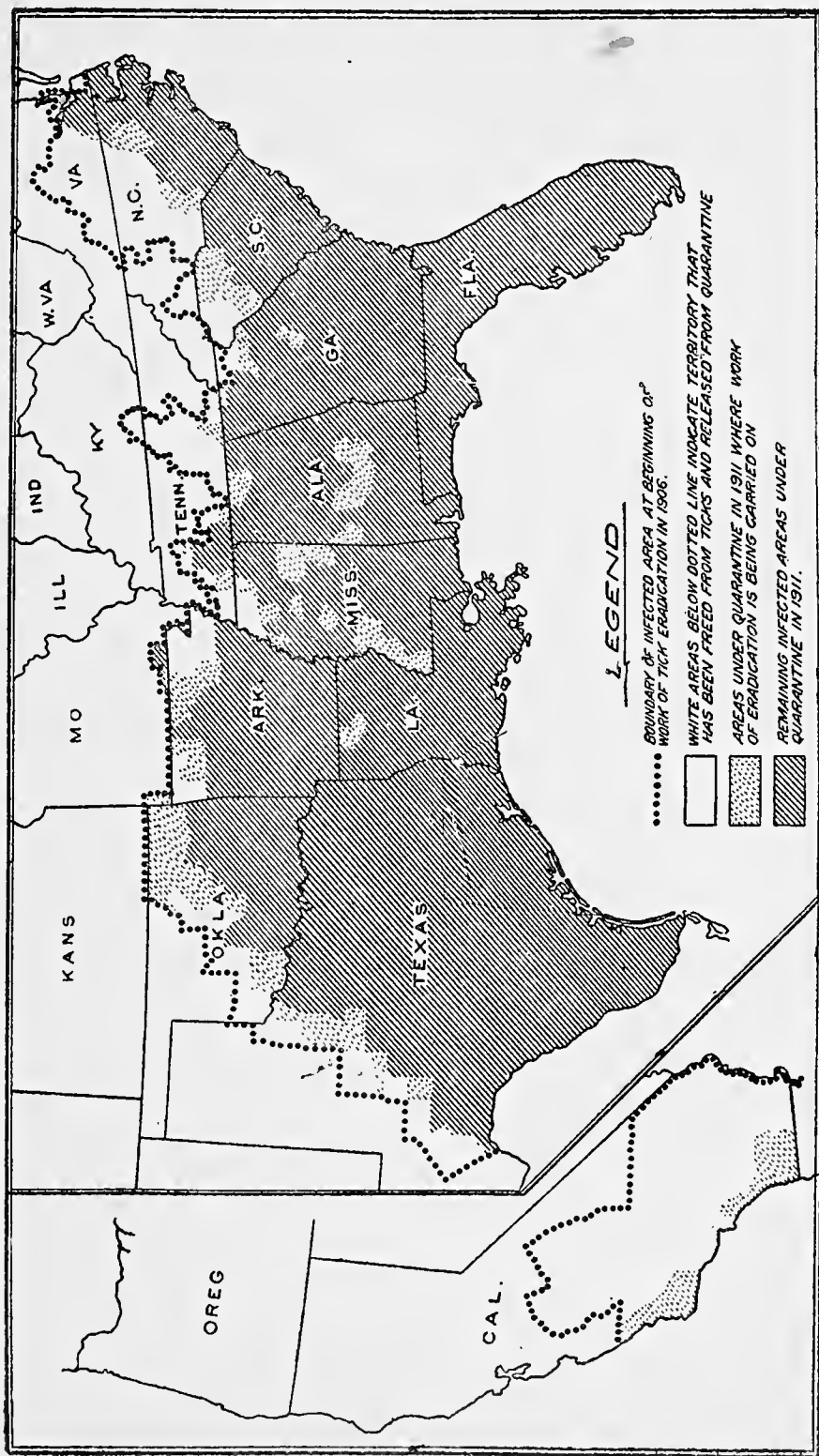
Some Obstacles to Progress.

Ignorance has been a great obstacle at all stages. While leaders in communities are informed concern-

ing the benefits of eradicating the ticks, they are in the minority, and educational processes must still go on. The opposition is fortified with certain attendant drawbacks which are sometimes pointed out, and by a vast amount of misinformation, which must be corrected. At the preliminary meeting of those interested in tick eradication held in Richmond, Va., in 1905, Dr. Tait Butler, then State veterinarian of North Carolina, took occasion to say to doubting members: "But it is being done; it has been done." If the doctors disagreed then, how much could have been expected? And how much can now be expected of him who lives isolated and reads not, or, reading, doubts? But it is upon this man—the farmer who has seen ticks all his life and knows no facts to point out their potency for harm—that States and counties are dependent for hastening the work.

Rapid progress in tick eradication is dependent in large part upon the thorough control exercised over the cattle during summer, fall, winter and spring, that they may not scatter ticks which may eventually infect other cattle or reinfect themselves through the seed ticks. The custom of turning cattle out to range through the unfenced swamps and roadsides prevents any tick eradication in many counties. The custom almost universally followed throughout the South of turning out cattle after the crops are gathered and letting them roam at large until the spring crops begin to grow has prevented success in many counties where tick eradication has been undertaken. Counties where this is permitted are known as "free-range" counties, while those having laws against cattle running at large are known as "stock-law" counties. When stock-law counties have been cleaned further effective work must wait until "stock-law" is adopted in the free-range counties. Cleaned cattle will always be more or less exposed to the ticks in the infected free-range regions.

Another class of obstacles lies in the methods of eradicating ticks. The surest methods, those depend-



ing on pasture rotation or feed-lot systems, fail because they are not used. Rotation is but exceptionally practiced. There are few fences other than the single pasture fence in the stock-law counties and the crop fence in the free range. These methods are practically and theoretically the best, but only those people conversant with the long educational campaign designed to bring about crop rotation and diversification of products can realize why they are not adopted. It is the free winter pasturage which costs the southern farmer so much.

Tickicides.

There are left the tickicides, including oils, crude petroleum, and arsenical solution. They are applied by hand swabbing, by spraying, or in dipping vats. The methods are successful in the order named, the last being the best. In every county there are a number of doubting people who grudgingly make a show of disinfecting cattle. There are others who will not disinfect unless repeatedly urged. Such as these are careless about the material used and about the application. They fail of success for a long time. There is still another class who really try to do their best. They may be misguided in the kind of remedy used; they may purchase what agents direct, but the material furnished may prove wrong; either it is too weak in the strength advised, or if oil it will not emulsify in the hard waters of the county. Too often the work is put off until large ticks have developed. The result is bad; no good is accomplished, and the season passes. The end is retarded.

More recently, however, arsenic solution has been willingly adopted by ever-growing numbers. It is sometimes applied by hand, but oftener by spray pumps or in the vat. In one county over 125 vats have been made; in other counties from 25 upward. In some cases the counties pay for the cement and disinfectant used, and the people of the communities fur-

nish gravel, sand, lumber and labor. The farmers drive their cattle to these vats at stated times twice a month and dip them, the process often being supervised by the agent. The cattle being thoroughly immersed, all ticks are wet in the solution. The errors of greasing methods by hand and spray pumps are avoided. The arsenic solution, being cheaper and less injurious to the cattle, is preferred to the oil. The public vat with arsenic solution is succeeding easily where other methods have failed. Each State should adopt and use it wherever possible.

It is recognized that ticks are the principal, if not the only, cause of depression of the cattle industry in the South, as the necessary feed may be easily raised there when cattle are considered to be worth the trouble. Tick eradication will thus build up another southern industry and help to maintain cotton production through the manure, a by-product of cattle feeding. Further, the cottonseed meal now sent elsewhere for feeding cattle and making commercial fertilizer will be retained for the same purpose at home, and the loss now incurred by its shipment will thus be stopped.

When these facts are thoroughly recognized, and the southern planter is brought face to face with the boll weevil, tick eradication will receive the attention it merits.

Prospects for the Future.

The fact that one-fifth of the infested area has been cleaned in the past five years does not afford grounds for estimating future progress. It is not reasonable to conclude that because the area cleaned was situated along the northern boundary it was easier to clean, and therefore that the remainder will require a proportionately longer time, or that because four-sevenths of the remaining counties are free-range territory this condition will indefinitely prolong the work. On the one hand, better methods will hasten work, and, on

the other, stock law may be adopted any year. It is true that tick eradication as now conducted waits on stock-law sentiment to prevail. Perhaps the demonstrated success of the work in one-seventh of the counties will prove an object lesson that will go far toward overcoming obstacles in the remaining area. There is hope that tick eradication, which has so far gone falteringly ahead, will soon advance with firmer tread toward its goal.

The cost of tick eradication to the Federal Government up to date has been less than \$1,000,000. Excluding over 40,000 square miles of semiarid lands released in California leaves 100,000 square miles disinfected at a cost to the Federal Government of less than \$10 per square mile. The cost to the States and counties has so far been much less, and there seems to be no prospect of its becoming more than that. The cost to the farmer is so quickly repaid by the well-being and improvement in cattle that all complaint of increase in taxes is quieted as eradication proceeds.

As one-seventh of the tick-infested territory has thus been cleaned at a cost to the Government of less than \$1,000,000, the other six-sevenths would, at the same rate, require about \$6,000,000. The estimated cost to any State may be attained by multiplying its infected mileage by \$10. It is probable that this cost will be maintained whether a State requires five or twenty years to complete disinfection.

DIRECTIONS FOR CONSTRUCTING A VAT AND DIPPING CATTLE TO DESTROY TICKS

By H. W. GRAYBILL, D. V. M., and
W. P. ELLENBERGER, D. V. S.

Arsenical dips as agents for destroying cattle ticks have come into much favor during the past few years. This has been due to their efficacy, cheapness, the ease with which they are prepared, and the comparatively slight injury they cause to cattle when properly prepared and used. Homemade dips as the ones most commonly used and are quite satisfactory in every way when ordinary care is used in their preparation. Recently there has been placed on the market a proprietary concentrated arsenical dip which has given good results. This dip is prepared for use by diluting it with cold water in the proportions of 1 to 100. The only advantage in such a dip is that comparatively little time is required in preparing the bath, but this advantage is largely counterbalanced by the fact that it is more expensive than a homemade dip.

Preparation and Use of Arsenical Dips.

The formula most commonly used in making an arsenical dip is the following:

Sodium carbonate (sal soda)...	pounds	24
Arsenic trioxid (white arsenic)...	do...	8
Pine tar	gallon	1
Water sufficient to make 500 gallons.		

If for any reason a stronger dip is desired, 25 pounds of sodium carbonate and 10 pounds of arsenic trioxid

may be used in place of the amounts given in the above formula. The stronger dip is required by the regulations of the Bureau of Animal Industry in the dipping of cattle which are to enter interstate commerce from quarantined areas, but for ordinary eradication work when immediate removal of the cattle to tick-free areas is not contemplated it will probably be best to use the weaker solution, and this is especially true during hot weather and when the animals are to be treated every two weeks.

In preparing the dip a large caldron or galvanized tank is required for heating the water in which to dissolve the chemicals. Thirty or forty gallons of water should be placed in the caldron or tank and brought to a boil. The amount of sodium carbonate indicated in the formula is then added and dissolved by stirring. When this is accomplished, the required amount of arsenic is added and dissolved in a similar manner. The fire is then drawn, and the solution permitted to cool to 140° F., or this process may be hastened by the addition of cold water. The pine tar is then added slowly in a thin stream and thoroughly mixed with the solution by constant stirring. This solution is diluted to 500 gallons before using.

If a larger caldron or tank is available for preparing the dip, a greater quantity of solution may be prepared at one time, always, of course, in the same proportion as the above. In this way the time required in preparing the amount of solution necessary to fill a vat is reduced considerably. In case it is necessary to use a smaller container, say of about the capacity of 25 gallons, only half the amount of solution indicated should be prepared at one time, the quantities of ingredients used being half those in the formula. This will, however, require so much time in preparing the amount of solution necessary to fill a vat that when possible it is advisable to provide a larger vessel for dissolving the chemicals.

The caldron or tank and utensils used in preparing the dip should be kept free from grease or oil, as small quantities of these may envelop particles of arsenic and prevent or hinder the solution of the arsenic. It should

also be borne in mind that when hard water is used in the preparation of the dip the dissolving of the sodium carbonate (sal soda) in the boiling water results in the formation of a fine white or gray insoluble powder or precipitate of lime salts which may be taken for undissolved arsenic, and thus lead to the belief that all of the arsenic has not gone into solution.

Diluting the Solution.

The arsenical solution may be poured into the vat as rapidly as it is prepared until the amount required to fill the vat, when properly diluted, has been made. The most convenient way of diluting the solution is to run the water into the vat through a hose or pipe. The capacity of the vat at the depth to which it is necessary to fill it for dipping, if not known, should be calculated, and for future convenience the water line should be plainly marked at some point on the wall of the vat. After the exact amount of solution necessary to furnish diluted dip to fill the vat has been prepared and placed in the vat all that is necessary is to allow water to flow into the vat until the surface of the dip reaches the mark made on the side of the vat. For example, if the capacity of the vat is 2,000 gallons, then four times the amount of solution necessary to make 500 gallons of dip should be prepared, placed in the vat, and the latter filled with water to the 2,000-gallon mark. In case the vat leaks it will be necessary to modify the above procedure by placing the concentrated arsenical solution necessary to fill the vat in barrels and only placing it in the vat when the latter is nearly filled with water, being careful to note, however, that there is ample capacity remaining so that when the solution in the barrel is added the dip surface will not be above the mark to which the vat is to be filled.

The capacity of the vat planned at a depth of 5 feet 3 inches is 1,470 gallons. In order to fill it to that depth with dip it will be necessary to prepare two batches of concentrated dip each containing the ingredients necessary for making 500 gallons of diluted dip and a third

batch containing 7 pounds 9 ounces of arsenic and 22 pounds 3 ounces of sodium carbonate in case 8 pounds of arsenic are being used to the 500 gallons, or 9 pounds 7 ounces of arsenic and 22 pounds 8 ounces of sodium carbonate in case 10 pounds of arsenic are being used to the 500 gallons.

Stock Solution.

When for any reason it is not convenient to follow the above method of diluting the dip, a stock solution may be prepared in which the quantity of ingredients for 500 gallons of diluted dip are dissolved in 50 gallons of water. Nine parts of water to 1 part of this stock solution will then give the proper dilution. The stock solution is found very convenient for replenishing the dip in a vat when it has become too low for dipping. A stock solution should not be made in more concentrated form than that given (50 gallons of stock for 500 gallons of dip), as the pine tar does not remain properly mixed when the solution is too concentrated.

The arsenical dip may be left in the vat and used repeatedly, replenishing it with the proper quantities of water and stock solution when necessary. When, however, the dip becomes filthy through the addition of manure and dirt carried in by the cattle, the vat should be emptied, cleaned, and filled with fresh fluid. The frequency with which this should be done must be left to the owner, as the condition of the dip at any period after it has been made depends on a variety of conditions, such as the number of cattle dipped, the frequency of the dippings, etc. Even though the dip may not become very filthy, its efficacy decreases somewhat on standing, owing to gradual oxidation of the arsenic. It is therefore advisable to recharge the vat if the dip is more than a month or six weeks old, irrespective of its condition as to cleanliness.

At the conclusion of each dipping it is well to mark the position of the surface of the dip on the side of the vat in order to determine at the next dipping whether

there has been a change in the level of the dip. If the surface of the dip has fallen and it is known that the vat does not leak, there has been a loss of water by evaporation and consequently an increase in the strength of the dip. In order to bring the dip down to its former strength water should be run into the vat until the dip surface reaches the mark made at the last dipping. If the fall has been due to the vat leaking, the strength of the dip has not been altered and consequently water alone should not be added. If the dip surface has been raised by rain the amount of water added in this way should be determined by calculation, and for every nine gallons of water one gallon of the stock solution previously mentioned should be used.

When not in use the vat should be tightly covered with a waterproof cover to prevent evaporation on the one hand and further dilution by rain on the other hand. Securely covering the vat when not in use also lessens the risk of accidental poisoning of stock and human beings.

Precautions in the Use of Arsenic.

On account of the fact that arsenic is a dangerous poison, great care must be observed in making and using the arsenical dip. From the time the arsenic is procured from the druggist until the last particle of unused residue is properly disposed of, the most scrupulous care should be taken in handling it. Guessing at weights or measures or carelessness in any particular is liable to result in great damage, and not only may valuable live stock be destroyed, but human beings may lose their lives as well.

Persons using the dip should bear in mind the possibility of absorbing arsenic through cuts, scratches, or abrasions of the skin and also by inhalation of vapors from the boiler in which the dip is prepared. It should be remembered that the absorption of even very small quantities of arsenic, if repeated from day to day, is liable ultimately to result in arsenical poisoning.

Cattle should always be watered a short time before they are dipped. After they emerge from the vat they

should be kept on a draining floor until the dip ceases to run from their bodies; then they should be placed in a yard free of vegetation until they are entirely dry. If cattle are allowed to drain in places where pools of dip collect, from which they may drink, or are turned at once on the pasture, where the dip will run from their bodies on the grass and other vegetation, serious losses are liable to result. Crowding the animals before they are dry should also be avoided, and they should not be driven any considerable distance within a week after dipping, especially in hot weather. If many repeated treatments are given the cattle should not be treated oftener than every two weeks.

In addition to properly protecting vats containing arsenical dip when not in use, another precaution must be observed when vats are to be emptied for cleaning. The dip should not be poured or allowed to flow on land and vegetation to which cattle or other animals have access. The best plan is to run the dip into a pit properly protected by fences, and the dip should not be deposited where it may be carried by seepage into wells or springs which supply water used on the farm.

The above precautions are given to inform persons not familiar with arsenic of its poisonous nature and the care that should be observed in its use, and to stimulate a proper care in those who know its poisonous nature and yet might be careless or who may not know all the precautions that should be observed. Unfortunately, however, the giving and emphasizing of such precautions have had the effect of arousing unwarranted fear of arsenic on the part of some stockmen and farmers, and have caused them, for a time at least, to refuse to undertake its use in treating cattle for ticks. For the benefit of those who may unduly fear arsenic because of what has been said, it should be stated that when reasonable care is observed in following the precautions given there is little danger of losses occurring. The arsenical dip has been extensively used during the past five years in tick-eradication work in the tick-infested area, and consider-

ing the number of cattle that have been dipped the losses have been very small. Some of these losses have been definitely traced to carelessness, and there is little doubt that if it had been possible to investigate all losses the majority of them would have been found to be due to this cause.

Method of Dipping.

The procedure to be followed in dipping animals on a farm depends on the end that is sought in undertaking the treatment. If it is simply desired to reduce and keep down the infestation of ticks on a farm, it will only be necessary for the owner to keep his animals under observation and dip them when, according to his judgment, treatment is necessary to keep the ticks under control. Such a procedure may well be followed where the regular tick eradication is not under way; that is, in instances in which it is not yet practicable or expedient to rid farms completely of ticks.

If, however, it is desired to rid the farm completely of ticks—and this should be the purpose in every case in which it is practicable and expedient—it will be necessary to dip all cattle, and also any horses, mules, or asses that may harbor the cattle tick, at regular intervals until all ticks have disappeared from the farm. The purpose of such dipping is to prevent as nearly as possible any engorged females dropping to the pasture and there laying eggs which in time may develop into young ticks. In order to do this it is necessary to dip at intervals short enough so that no tick after getting on the cattle will have time to mature and drop off before the next dipping. An interval between dippings of two weeks is considered most satisfactory. This interval, however, may be increased somewhat if necessary, but it should never be greater than three weeks.

In freeing a farm of ticks the dipping should not be discontinued until it has been determined with certainty that the cattle and premises are free of ticks. It should be borne in mind that it is almost impossible to deter-

mine by a few inspections, even if carried out with great care, that animals are free from ticks. If the treatment is discontinued and a few unobserved ticks are still on the animals, these, on maturing and dropping, are likely to give rise to a new brood of young ticks. Moreover, even if the cattle are actually free from ticks, the fact should not be lost sight of that there may still be engorged females, eggs, and seed ticks on the premises. This is most likely to be the case during the colder part of the year when the development of the tick on the ground progresses slowly and also when any seed ticks that may be present are likely to be slow in reaching the cattle because of inactivity resulting from the low temperature.

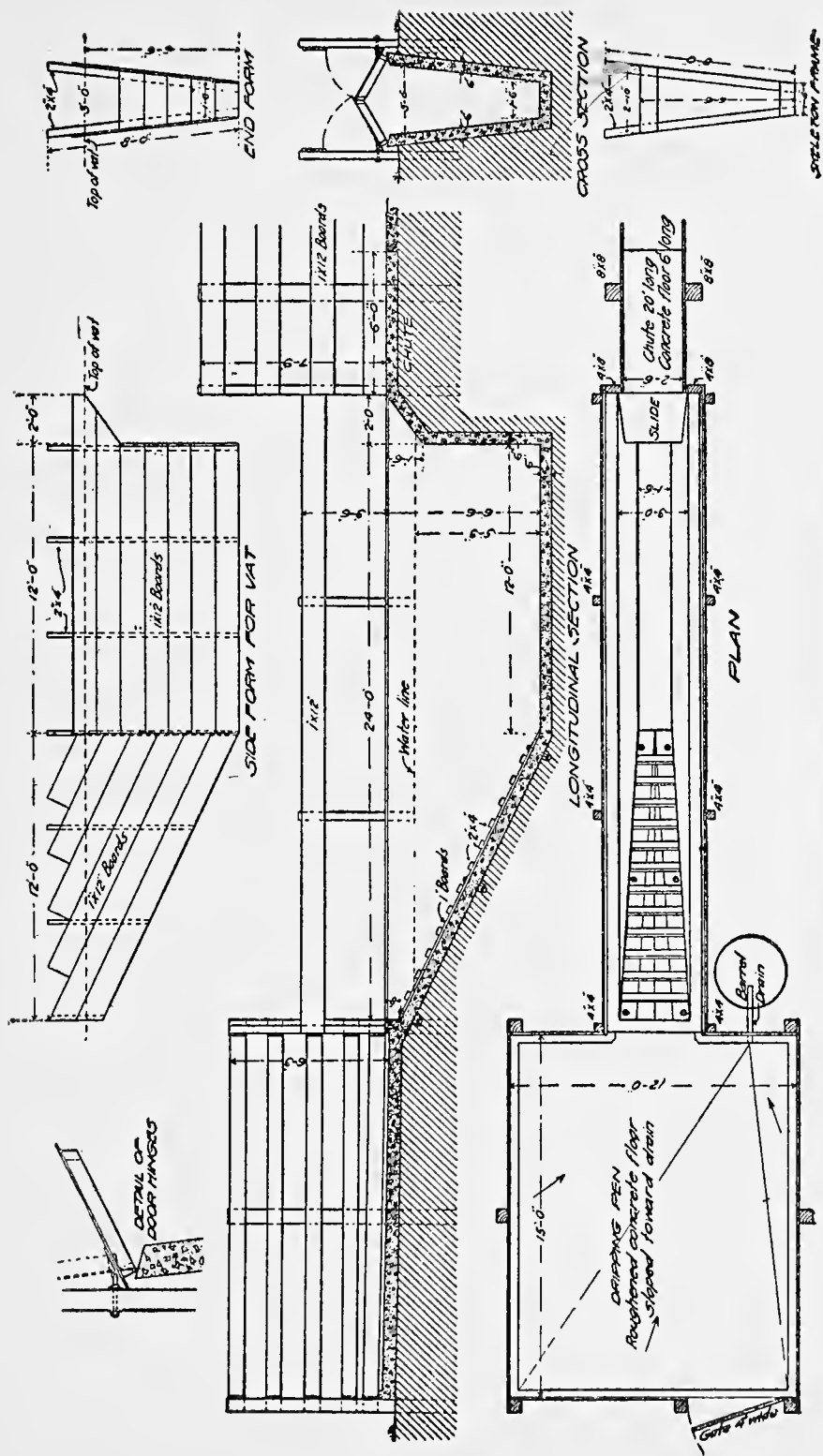
Specifications for the Construction of a Concrete Cattle-Dipping Vat.

The site selected for the location of the vat should be dry and of sufficient size to admit of the construction of the chute, the dripping pen, and at least two additional pens—one for holding the cattle prior to dipping and the other for retaining them after dipping until sufficiently dried.

Excavation.

The excavation should be made 1 foot wider and 1 foot longer than the inside dimensions of the vat and should conform to its shape. The inside dimensions of the vat are shown on the drawings (Fig. 1) and are as follows: Length at top of vat, 26 feet; bottom 12 feet. Width at top, 3 feet; at bottom, $1\frac{1}{2}$ feet. Depth, $6\frac{1}{2}$ feet.

The sides and bottom of the excavation should be firm and solid, as they are to serve for the outside forms in casting the concrete. If it is necessary to do any filling in order to conform to the shape of the vat, the filling should be puddled and thoroughly rammed until solid, because the stability of the concrete depends on the foundation.



Vat for Dipping Cattle to Destroy Ticks.

Forms.

The wooden forms should be constructed of 1-inch boards and 2 by 4 inch braces, the boards being nailed to the outside face of the braces, as shown in the drawings. The sides and end walls should be built 8 inches higher than the surface of the ground, which should be level.

Concrete.

The concrete should be made of 1 part of cement, by measure, $2\frac{1}{2}$ parts of sand, and 5 parts of broken rock or gravel. The cement should be of a standard brand of Portland, the sand clean and coarse, and the broken rock from about $\frac{1}{4}$ -inch pieces to not larger than will pass in every direction through a 1-inch ring.

Mixing.—The mixing should be done on a tight wooden platform or in a tight box. The sand and stone should be measured in a bottomless box, $2\frac{1}{2}$ feet long by 2 feet wide by 1 foot deep, having a capacity of 5 cubic feet. A convenient size of batch to mix is one consisting of 2 bags of cement, 1 measure (5 cubic feet) of sand, and 2 measures (10 cubic feet) of stone.

The sand is measured out first and the cement emptied on top, after which the two materials are thoroughly mixed together, dry. In the meantime the stone may be measured out and thoroughly drenched with water. The cement-sand mixture is mixed with water and the resulting mortar then combined with the stone. The stone should be shoveled on the mortar, which has been previously spread out in a thin layer. Mixing should continue until the stone is thoroughly coated with mortar, more water being added during the mixing process if necessary.

Laying.—Before laying the concrete the molds should be set and thoroughly braced into place. The side forms may be suspended in the excavation with their lower edges 6 inches from the bottom by means of crosspieces nailed to the uprights and of sufficient length to rest on supports located several feet from the edges of the ex-

cavation. The concrete for the bottom and incline is deposited first, this mixture being of a consistency that water will flush to the surface on ramming. The mixtures for the sides and end should be very wet and should be thoroughly puddled into place. The consistency of the concrete for the side walls should be such that it will run off the shovel unless handled quickly.

The laying of the concrete should be done, if possible, in one operation, in order that there may be no joints between the new and old work. If it becomes necessary to lay the concrete on two or more days the surface on which the new concrete is to be deposited should be washed thoroughly clean and coated with grout of pure Portland cement and water mixed to the consistency of cream. The new concrete should be placed before the grout has set. Extreme care should be taken to prevent dirt from falling in on top of the deposited concrete.

The forms should not be removed until the concrete is set, which in moderate weather will have taken place in about 24 hours. In damp, cold weather at least 48 hours should be allowed before removing the forms. It will be advisable, especially in water-soaked ground, to allow the forms to remain in place for one week before removal.

Finishing Coat.—Before applying the surface coat dampen the walls and floor thoroughly. Cover the entire exposed surface of the floor and walls with a coating one-half inch thick of cement mortar composed of Portland cement 1 part, sand 2 parts. Coating to be floated and troweled to a smooth finish.

Waterproofing.

If the earth around the vat is thoroughly drained the vat may be waterproofed by painting the surface coat, but painting the surface will not give satisfactory results if there is ground water to seep in. The paint may be good hot pine tar, or gas-house tar cut with naphtha or gasoline and applied with a brush, or after the mortar coat has hardened the inside of the vat may be painted with an oil-cement paint made as follows: Mix enough

water with Portland cement to make a fairly stiff paste; add to this 5 per cent of heavy petroleum residuum oil based on the weight of the cement, and mix thoroughly until the oil entirely disappears, then add more water and stir until a paint of the consistency of cream is formed. This paint should be applied with a brush and should be well rubbed into the surface. Should the mortar coat be omitted the paint coat should be applied directly to the surface of the concrete.

Exit Incline.

As the exit incline is to have a false wooden floor, it will be necessary to embed iron bolts in the concrete, to which the wooden floor may be fastened. Before the concrete incline is laid embed in the dirt three pieces of 2 by 4 inch scantling, placed at the top, center, and bottom of the incline. The bolts should extend through these pieces and should be placed with the head next to the dirt. The bolts should be long enough to extend through the concrete and the inch boards of the floor, so that the wooden floor may be securely fastened.

Slide.

Cover the slide with a sheet of boiler iron properly fastened to the cement.

The cover of the vat consists of two leaves hinged on posts set 3 feet in the ground along each side of the vat. The leaves are 2 feet 6 inches wide, and when open rest against the upper part of the posts to which they are hinged and serve as splash boards. The details of the hinge used and the method of setting it are shown in the drawings. When the leaves are open their lower edges are just above the top of the side walls, which are given a slope inward for the purpose of conducting the dip running from the splash boards back into the vat. Removable doors should be constructed to close the triangular openings left at the ends of the vat when the cover is closed. The hinges may be made by a blacksmith.

Dripping Pen.

Construct a dripping pen about 12 by 15 feet at the head of the exit incline. The floor should be of concrete prepared as previously described for the vat and laid in a similar manner. The floor should be pitched toward a corner of the pen, where a pipe should be laid in the floor to carry the drippings into a barrel sunk in the ground. The drippings thus caught may be returned to the vat after settling. The floor should be roughened to prevent the cattle from slipping.

Chute.

The chute leading to the vat should be built 30 inches wide and 20 feet long, and the receiving and retaining pens should be of a size to take care of the animals to be dipped.

Bill of Materials for Vat, Dripping Pen and Chute. Lumber for Forms.

8 pieces 1 by 12 inches by 14 feet long.
13 pieces 1 by 12 inches by 12 feet long.
2 pieces 1 by 12 inches by 9 feet long.
2 pieces 1 by 12 inches by 6 feet long.
2 pieces 1 by 12 inches by 4 feet long.
8 pieces 2 by 4 inches by 8 feet long.
2 pieces 2 by 4 inches by 7 feet long.
2 pieces 2 by 4 inches by 6 feet long.
2 pieces 2 by 4 inches by 4 feet long.
2 pieces 2 by 4 inches by 2 feet long.
7 pieces 1 by 6 inches by 12 feet long for crosspieces for inside of forms.

Lumber for Dripping Pen.

7 pieces 6 by 6 inches by 10 feet long for posts.
10 pieces 1 by 8 inches by 16 feet long for side rails of pen.
5 pieces 1 by 8 inches by 12 feet long for side rails of pen.

5 pieces 1 by 8 inches by 8 feet long for side rails of pen.

The covers can be made from the lumber used in making the forms, and the lumber for the exit incline can be gotten in the same way.

The 4 by 4 inch posts to which the cover is hinged may be made from 2 by 4 stuff by spiking together.

End form to be made solid.

Hardware and Ironwork.

6 bolts, $\frac{1}{2}$ by 10 inches, with nuts and washers, for false floor of incline.

1 sheet of $\frac{1}{4}$ -inch boiler iron cut to shape of slide; plate bored and countersunk for four screws.

4 pairs hinges for covers.

3 heavy T hinges and screws for gate of dripping pen.

1 heavy iron bolt to fasten gate.

Concrete—Vat.

Cement, $10\frac{1}{2}$ barrels (42 bags).

Sand, $3\frac{3}{4}$ cubic yards.

Stone, $6\frac{1}{4}$ cubic yards.

Dripping Pen and Chute.

Cement, $5\frac{1}{2}$ barrels (22 bags).

Sand, $1\frac{3}{4}$ cubic yards.

Stone, $3\frac{1}{2}$ cubic yards.

A 26-foot vat has been used extensively for eradication purposes with satisfactory results. However, if it is desired to lengthen the body of the vat on account of large numbers of cattle to be treated, or to make it conform to the bureau's requirements for the treatment of cattle for movement as non-infectious, there should be added to the amount of concrete material for each lineal or running foot, cement, 0.37 barrel; sand, 0.12 yard; stone, 0.24 yard.

By some a dripping chute is regarded more satisfactory than a dripping pen. One of the advantages that it has is that the cattle are held in line in the order in which

they have been dipped, thus making it possible to remove one or more of them at a time as soon as they have drained sufficiently, in order to make room for others. In using the dripping pen this is not practicable and it is necessary to wait until the last animal dipped has drained sufficiently and then remove them all together.

In case it is desired to construct a dripping chute it should be located at the head of the exit incline in line with the vat. It should be about 36 inches wide. The length will depend on the number of cattle it is desired to accommodate at one time, it being necessary to allow 4 to 5 feet for each. A length of from 20 to 40 feet is considered a convenient size for small herds. The floor should be made of concrete and sloped toward the vat. The dip should not be permitted to run directly into the vat, but should be collected in a barrel to settle, as shown in the case of the dripping pen. The floor at the sides should be raised about 2 inches in the form of a curb to keep the dip from running off.

THE HIDE AND SKIN TRADE IN GREAT BRITAIN

During the past fifty years the hide and skin trade of Britain has seen many changes, and, in some respects, it has undergone a complete transformation. From a comparatively low-priced by-product, hides have become elevated into a commercial position which has brought about startling changes in the method of collection, preservation and distribution, and at the present time so great is the scramble for British hides that tanners are faced with the real difficulty in making—or attempting to make—low-priced leather from dearer and dearer raw material. Of course, hides have now become an international product, so that conditions approximate practically all the world over.

Early Legislation.

Before proceeding, however, to discuss modern conditions prevailing in the British hide business, it may be of interest to briefly note that the question of the proper preservation and flaying of hides has been made the subject of legislation from very early times in Britain. This was probably due to the fact that a proper supply of hides for turning into leather for military purposes was regarded as a prime necessity of the times, as it is obvious the abundant supply of foreign hides now so common was not available at the periods mentioned. The various butchers', tanners' and other trades guilds of the period also took care of the hide supply, and a search in connection with some of the old documents bearing on the subject yields a good deal of quaint and useful information as to the regulations prevailing.

In a book of this sort, however, which deals with the business side of the question, it will be impossible to fill much space by quoting such matter. Still, it is interesting just to mention one or two extracts from old Acts of Parliament which have a bearing on the subject.

The King James Act.

In 1604, during the reign of King James, an Act was passed which included the following clause:

“Be it enacted by the King’s most Excellent Majesty, the Lords Spiritual and Temporal, and Commons of the present Parliament assembled, and by the authority of the same, That from and after the Feast of St. Bartholomew the Apostle, next coming, no butcher, by himself or by any other person, shall gash, slaughter or cut any hide of any deer, bull, steer or cow in slaying thereof, or otherwise, whereby the same shall be impaired or hurt, upon pain of forfeiture for every hide so gashed, slaughtered and cut, twenty pence; and that no butcher shall water any hide except only in the months of June, July and August, nor shall offer or put to sale any hide being putrefied and rotten, upon pain of forfeiture for every hide so watered and for every hide so putrefied and rotten, and offered or put to sale, three shillings and fourpence.”

The Act, from which the above is extracted, repealed a statute of Queen Elizabeth and all former statutes, so that it is clear the hide question was an important one, even at these early times of English history.

The matter seems to have reached another stage during the reign of Queen Anne, as the Act of James was repealed and another Act passed, from which the following extract is taken:

Penalty for Bad Flaying.

“Penalty on gashing hides and skins and for the better preventing the gashing and cutting of any hides

in slaying thereof, whereby the same shall be impaired or hurt, it is hereby enacted that from and after the four and twentieth day of June, one thousand seven hundred and eleven, if the raw hide of any ox, bull, steer or cow, or the skin of any calf, shall wilfully or negligently be gashed, slaughtered or cut in the slaying thereof, or being gashed, slaughtered or cut, as aforesaid, shall be offered to sale to any butcher, or other person or persons whatsoever, then in every such case, the butcher or other person who impaired or hurt the said hide, by gashing, slaughtering or cutting, as aforesaid, or the person offering the same to sale, shall, for every such offence, forfeit and pay the sum of two shillings and sixpence for every such hide, and one shilling for every such calve-skin, to wit, one moiety thereof to the poor of the parish where the same shall be found or offered for sale, and the other moiety thereof to such persons as will seize, inform or sue for the same."

There is no doubt that in later times, when these Acts became obsolete, the quality of the flaying, preparation and preservation of hides steadily deteriorated, and it is only in comparatively recent times, when hides became scarce, and their uses increased to a very large extent, that any attention has been devoted to an improvement in one of nature's best productions, impossible to replace or add to, as live stock is not raised for the covering but for the meat produced.

As mentioned before, a great deal of attention was paid to hides by the various ancient corporations, and protection was followed out in a way which looks archaic and quaint at the present time. Trading was only allowed within certain local limits, while all sorts of artificial barriers were raised to prevent the free trading in raw stock as we have it in the twentieth century. Just one old case may be quoted, perhaps, as throwing an interesting light on the subject. From an old Nottingham record, it appears that in the year

1396 the inhabitants of two English counties were in the habit of visiting the great weekly market, and a man attended from Breedon, in Derbyshire, with a load of hides. Four townsmen complained to the authorities that "they had spoken with him for the aforesaid hides, and were all but agreed as to the price, when a culprit came secretly and bought for a greater sum," etc. What the decision arrived at was, does not seem to be very clear, but if matters of this kind were given much attention to at the present time, it is likely some of our trade associations would have little else to do except settle such disputes.

An extract from the Northampton "Liber Customarium," an old book, in which all the local customs of the town were duly set forth, must conclude the brief historical references to ancient English hide trading. This is dated 1460, and it is stated herein:

"No stranger may buy hides or pelts but in time of fair.

"No man of Northampton to go out of the town at none of the gates for to meet the men of the country that bring hides or wool to sell, but to buy in the market only.

"No butcher henceforth to haunt the butchery as a master till he have given to the town three shillings and sixpence, as in old time they were wont to give."

The first proviso was evidently designed to protect the local tanning industry, as monopoly and protection seem to have been the first principle of medieval local legislation. It is obvious the local authorities were bound to grant an exception at fair times, otherwise the rustic sellers would hardly have brought produce to suit the convenience of the town people. It is also curious to note that butchers were not allowed by custom or law to go out of the town to sell their output of hides.

Tanned leather, by the way, was also later on taxed by the British Parliament, and was in fact only freed from this impost about a century ago. The re-

moval, however, of all the absurd restrictions to the hide and tanning business has been a good thing for the various branches which have continued to prosper, and still continue to do so under a more up-to-date and enlightened regime.

The Collection, Distribution and Sale of Hides.

Until a few years ago, before the idea of hide and skin depots and hide markets was developed, hides from the cattle slaughtered by various butchers were sold to the local tanners, fellmongers, tallow chandlers, country carriers, etc., who either came to the slaughter house and bought up the goods or made short contracts for them. The system was not very satisfactory for many reasons, as much time and money were spent in going around and collecting the hides and skins, bargaining for them, and getting them to their final destination. This system, however, continued in force until railway communication became more general, but with the present input of some of the big yards, which work in two or three thousand hides weekly, it would hardly be a practicable proposition. Obviously, all sorts of hides had to be taken, the collection including steer—or oxhides, as they are called in England—cowhides, calfskins and sheepskins. The inconvenience in handling such a mixed collection is obvious, and need not be enlarged upon.

This old method is still followed out in some out of the way districts, where railway communication is bad or uncertain. Tanners or dealers send their carts for the few hides and skins available, and prices are fixed according to circumstances. Few cheap hides, however, are now to be had, as the leather trade papers regularly publish the average prices obtained at public markets, while brokers regularly send out schedules of prices to the most remote country butchers, often with an offer to purchase the entire production at market prices.

Modern Methods of Buying.

In some districts, tanners and fellmongers send out their own buyer to visit the butchers almost every day, who fix the rates for the hides and skins; in others they contract monthly with the butchers for the best skins. Generally speaking, hides are contracted for at so much per pound, or per stone of 14 pounds, say, from under 60 pounds and over 60 pounds, the prices varying according to the quality of the hides.

hides. Formerly, hides were bought with the horns and skull attached, but a few years ago, mainly owing to the influence of the various tanners' federations, an improvement was brought about in this direction, so that now tanners, at all events, get a fair proportion of hide, and not a quantity of bone and horn, which not only was useless, but cost money to transport both to and away from the yard.

Unfortunately, there are still a few tanners in Britain who prefer to stick to the old methods of purchasing hides with horns, skull, etc., attached, but practically all the leading hide and skin markets sell them without these encumbrances.

The Market System.

When the idea of establishing hide and skin markets came into existence, the scheme was opposed in many directions, many tanners professing to object to the tried and established method of collecting their raw material. Many of them spent large sums in the attempt to destroy the modern system, but eventually it became established, and to-day few tanners, except the very small ones, urge much objection to buying their hides from markets, properly prepared, graded and weighed to suit their own special requirements.

Apparently, when the idea of hide and skin markets was first brought forward, the scheme was not regarded as a money-making concern, but was primarily introduced to ensure the butchers a fair market price

for their by-products. Commission charges were simply taken to pay expenses, but the success of the project attracted some of the cuter commercial spirits, and the markets were in many cases turned into limited companies and showed a good profit on the business.

Hide Market or Auction Methods.

Hides and skins are received at the various markets from all sorts of sources, and on arrival are all selected, classed, and placed in piles not exceeding 30 hides. The selection is mainly according to weights, viz.: 49 pounds and under, 50 to 59 pounds, 60 to 69 pounds, 70 to 79 pounds, 80 to 89 pounds and 90 pounds and over. These market hides have the shanks cut off square at the hocks and knee. The lips and all superfluous parts of the hides are cut away, and the weights marked on the butt end near the tail, this being the green net weight of the hide, after deducting an allowance settled by the hide classer for wet, manure, or any other additional adhering substance showing at time of weighing.

Inspection and Weighing.

In most markets, hides are weighed on a special scale and a clerk checks every weight before the hide is booked. From this book they are again checked out, and invoiced to the tanner. Some great hide centers, such as Newcastle and Liverpool, have an independent inspector, who classes for all the local markets. As in America, hides are classified according to quality, substance, flaying, warble holes and general condition, some markets bearing a good name for their goods, others being held under suspicion.

Improvements Through Organization.

Of late years a good deal of attention has been paid to the hide question by the British trade press, the tanners' federations, and several special authorities

who have studied the question. All sorts of estimates have been made as to the annual loss brought about by cuts, wide scratches and warble holes. Deputations have waited on the leading government officials connected with the Board of Trade, and it would seem as if a great improvement is to be brought about in the very near future. In many cases good work is being done in this direction by the hide and skin markets, which offer premiums to slaughtermen who send in fairly perfect hides. In 1911, for instance, the total number of hides inspected by the Newcastle Hide Inspection Society was 88,027, the classification being as follows: First class, 38,279; second class, 47,736; third class, 2,012. In this particular case, there was a decline in the number of first-class hides, as compared with the previous year, warbled hides being specially on the increase. In fact, the report issued in connection with this market states that out of the total number of hides inspected, probably not 20 per cent are free from the ravages of this pest.

It is calculated by competent authorities that about 80 per cent of the hides slaughtered in the United Kingdom are now handled by established markets; the tanners can either attend the market auctions or they may employ a commission agent, who will probably buy for him at a lower price than he could himself. The hides are usually sold by catalogue at the larger markets, such as Bermondsey (London), Newcastle, Leeds, Liverpool, Bristol, Birmingham, Sheffield, etc., and, although all sorts of tricks are alleged against the regular attendants, yet on the whole the system works well, and, in any event, tanners are now more or less assured of obtaining hides suitable for their special or particular trade.

Further Reforms Projected.

The conditions appertaining to the purchase of hides have not been regarded as very satisfactory in Britain for some time, and all sorts of suggestions have from

time to time been made by the various federations. It is now proposed that the various local associations shall appoint small committees, annually elected, which shall be made up of tanners, commission agents and hide brokers in the locality of each market, who will deal with complaints. It is also suggested that the classification and weighing shall be carried out by chosen men supervised by the committee, under a standard which is to be settled by the tanners' federation. All hides are to be weighed, and stamped on the flesh side or tail with the marks A. B. or C. It is also suggested that markets or approved collections inspected by a federation shall be registered, and that buying shall be only made through these registered channels.

The above are about the latest proposals put forward by the tanners' federations, and deposits of cash and certain guarantees are made in connection with the scheme. The slight cost of the above scheme is to be borne by the buyer and seller of the hides, and is to be collected by the selling broker.

During hot weather, English market hides are slightly salted to preserve them; those which have to travel long distances by rail or ship are of course heavily salted, all being baled up and tied in convenient bundles with stout cord.

Anglo-American Hides.

As regards the treatment of hides taken from American cattle slaughtered at such ports of entry as Deptford, Birkenhead, etc., these are usually well flayed and of good quality, and are regularly sold at high prices to British and foreign tanners. When the turn of the market is favorable to the transaction, certain selections are re-shipped to the United States, small plump best hides, for instance, suitable for best classes of leather belting being often returned to the United States in this manner. A good deal of nonsense, by the way, is talked about this phase of

the hide business in Britain by ardent political protectionists, and at the last parliamentary elections it was often stated that there was a proviso in the selling agreement—always insisted on by American cattle shippers—that the hides from the cattle were to be re-shipped to the land of their birth. In some cases, politicians even went so far as to tell their audiences that this was a strict provision under the Dingley tariff.

At these depots of slaughter, hides are often salted down in large quantities, as many as 1,200 often being placed in one stack. They are carefully selected, weighed and salted, all the outer edges being turned in toward the center of the pile. Every attention is paid such hides, and no doubt we are largely indebted to some of the big American packers, who have depots on this side, for the increased care and attention hides have been shown during the past few years.

Varieties of Cattle and Hides.

In a review of this sort, it is not necessary to devote much space to a consideration of the various breeds of cattle or the sort of hides obtained from them. Mention might, however, be made of a few representative classes. Kyloes are considered the best, as they throw a level stout hide, as the beasts mature slowly. They are very square and short legged in the pure-bred classes. Runts, or Welsh, or a similar hide, and are suitable for tanners who wish to turn out a stout butt. Another good class is the Aberdeen Angus, which possesses a smooth coat and are a variety of black-polled cattle from the north of Britain. Galloways are a similar hide, but are rather smaller, and throw a somewhat plumper hide than the Angus. These representative breeds are considered to be about the best hides in Britain, and formerly brought about a penny a pound more than other hides offered. Hides lighter in substance, however, are now rather more required, so that the difference is not now

so marked, although in many markets they are still given a special classification in the regular schedule. A fine spready hide is also obtained from the Hereford breed, these being favored by harness and belting makers. The Devon breed of cattle are also much esteemed, and produce a good pattern hide, which is useful for many purposes in leather manufacture.

Foreign Trade in British Hides.

A moderate business is done in connection with the export of hides and skins of British origin, America at times taking fair quantities of hides from our markets when prices warrant it. The quantities and values of hides exported taken from cattle slaughtered in the United Kingdom for the past three years were as follows: 1909, 285,084 cwts. (value, £800,812); 1910, 196,962 cwts. (value, £552,021), and 1911, 215,901 cwts. (value, £594,843). In 1911 the destination of this quantity of tanners' raw material was as follows: Germany, 59,562 cwts.; United States of America, 84,117 cwts.; Canada, 26,691 cwts.; other countries, 45,531 cwts.

Imports of Hides.

Against this there is a very large import of hides into Britain from practically every corner of the world. The abundant supply of raw foreign material being taken special and full advantage of by the large sole and dressing leather tanners of the north and western parts of England. A good deal of this material arrives at the Thames riverside wharves in London, and is there classified, graded and weighed, prospective buyers being allowed the opportunity of visiting the wharves and inspecting samples of the lots on offer. Here valuations are marked off by them on catalogues, and in due course the buyer or his broker bids for the hides in open competition at the periodical auctions which are held several times a year in Mincing Lane, London.

Hides Tanned in England.

A vast amount of the quantity of dry, dry salted and wet foreign hides which goes to London is, however, again re-exported, but, after allowing for this, dry hides to the value of £784,570 were worked into British tanyards in 1911, as compared with £974,775 in 1910. Wet foreign hides worked in during 1911 amounted to the very large figure of £1,661,278, as compared with £1,890,953 in the previous year. It is certain, therefore, that British tanners are very largely dependent on the foreign sources of supply for their raw material. It is not too much to say that, had this supply not been available of late years, the sole-leather trade would have been in a bad way, as a good and cheap mixed tanned sole leather has been produced from foreign hides, which has effectually competed with the import of American hemlock and Australian tannages.

Disposal of Sheepskins.

Many of the above remarks apply with equal force to sheepskins, as regards the collection and distribution of this raw material. Sheepskins, however, are not sold by weight. They are received at the market by the skin classer or his assistant, and are marked on the catalogue according to the system in vogue at the place. Such marks as XX. X., A. B. C. D. are often favored; in other centers they are classed as firsts, seconds, thirds, fourths, etc. Shorn skins are a separate class, as are lambs, and wool skins which have been clipped once. Lambs which have grown out of the real lamb stage are classified as Hogs, Hoggetts or Tegs, according to the locality in which they are sold, but the letters A, B and C are generally in use as classing terms in all markets.

Inspection Committees.

In some of the leading markets, such as Newcastle and Liverpool, there are buyers and sellers who form

a hide and skin inspecting committee, which appoints a man to pass or grade the hides or skins into the various classes. This individual is termed a hide inspector, and is quite independent, as he is not employed by the selling broker alone, but, as stated, paid and controlled by the inspection committee.

In classing sheepskins in British markets, attention is paid to the size of the pelt, the quality of the flaying, the condition of the flesh side, scabs, spoilt places, quantity and quality of wool and the amount of damage this has received by tar, dips or dyes. A good deal of experience, tact and skill is required in a skin classer, who has to strike a balance of equity between the sender and the buyer of the skin. On the whole, however, the system works fairly well, and is productive of plenty of competition between fellmongers who regularly attend the various markets. The fellmongers are loud in their complaints that the values of wool skins have been forced up to a point at which there is neither profit nor pleasure in doing business. This, however, seems common to the buyer of all kinds of tanners' raw materials, but as the general business seems a flourishing one, it is quite likely fellmongering or wool pulling is quite as profitable a business as most other sections of the hide or leather trades.

Horsehides and Calfskins.

In dealing with the British hide and skin trade, it is not necessary to take up much space by dealing with horse and calf skins. The trade done in these directions is only a moderate one, and, in the case of horsehides, seems to be a steadily declining section, owing to the rapid displacement of the horse by mechanical traffic. Probably a great part of the horsehides collected and sold on our markets, and by private dealers, find a market abroad, quite a big business, comparatively, being done with the United States, where they are used largely for heavy glove work, enameling, etc. Almost the only outlet for the salted butts now seems

to be Russia, where they are still used for converting into waxed leather for the high boots favored by certain classes of wearers. In England, horse slaughtering has to be licensed by the local authorities, and, as the business is not much liked, licenses are now seldom granted, especially in great centers of population.

Quite a fair quantity of British horsehides find their way to the Continent, especially to Germany, where they are either bark-tanned and dressed for enamel-



The green weight of hides, in certain sections of England, as credited to the local butcher, is usually marked on the butt of the hide, near the tail, with knife cuts. Strokes crossing the horizontal line represent twenty pounds each and those above the line ten pounds each. Figures under ten pounds are made in Roman numerals under the horizontal line. In the above cut the weight of ninety-eight pounds is expressed.

In France a similar method is followed, the weight being given in pounds of half a kilogramme (50 kilos equals 110 pounds). The above cut is self-explanatory in regard to this method.

ing, or turned into chrome leather for imitation box leather.

However collected, whether from the slaughterers or from other sources of supply, horsehides are usually classified at the recognized markets into firsts, seconds, thirds and fourths quality, and are sold by the piece. Like all raw stock, however, their value is steadily advancing, and as the supply will in all probability decline as motor traffic increases, there is every

reason to believe values of this class of stock will reach abnormal figures.

Compared with the great veal-eating country of Germany, or even France, the amount of calfskins handled in Great Britain is very small, and this is one reason perhaps why such progress has been made in the calf leather trades on the continent of Europe. Calfskins are collected and handled much as described in the remarks on hides, most of the recognized markets regularly receiving small supplies every week. They are usually classified as follows: Seventeen lbs. and over, 9 lbs. to 16 lbs., 5 lbs. to 8 lbs., and under 5 lbs. Kipcalf and casualty or damaged calf are scheduled under special headings. There are no reliable statistics available showing the amount or value of exported calfskins of British origin, but at times fair-sized parcels of skins leave this country for the United States, the cheaper and "kip" classes being most favored when the market permits of large deals. On the other hand, quite a fair-sized trade is done with the continent in raw calf, many of our tanners of straight-tanned and chrome calf depending for their supply of raw stock on regular parcels of Dutch, French, Swedish, Danish or other skins.

EUROPEAN HIDES AND SKINS

Of late years, owing to comparative scarcity and high prices, to say nothing of the increasing uses to which leather is put, hides and skins have received much more attention in Europe than was formerly the case. Efforts have been made, and with a great amount of success, to obviate the loss caused by bad salting, warbles and careless flaying, and at the first Conference of the Leather Trades held in Turin in September, 1911, quite a large proportion of the Agenda was devoted to subjects connected with the raw materials of the tanners' industry. In some cases government attention has been given the methods of preserving and curing hides, whilst the various technical schools, butchers' and tanners' associations have also been directed to a betterment of such questions as the prevention of warbles and improved methods of flaying. Much, however, remains to be done before wastage is stopped, but the advances made in the past, and the attention given the question at the present time, augur well for the future.

It is impossible in the space at disposal to enter fully into the subject, as it is a very large and comprehensive one. In such a continent as Europe, parts of which are big centers of population, whilst others are sparsely populated, one can hardly deal with the methods followed out all over the continent. However, enough may be said to give readers a general idea of conditions and to show that, at any rate, in some countries, the value of hides and skins is fully recognized by the care and treatment they receive.

Marketing Hides in France.

In France, especially in such towns as Paris, it is becoming more and more the custom for country butchers

to send their hides and skins to the local hide markets for sale at the periodical auctions. In centers where butchers are not organized on the co-operative and profit sharing principle, butchers send their goods to salters, with instructions that they should be sold for their account by auction. These auctions, as a rule, take place in each district at regular intervals of about once a month.

In France, the selling conditions vary in each district; in some places hides are sold with the horns and skull bones taken out, whilst in others they are allowed to remain in, and allowance is made in the weight for adhering dirt and manure. Although efforts have been made by parties interested, it has not yet been possible to obtain any agreement or cohesion between these auctions, or to get them to adopt any uniform method of sale. Still, butchers and tanners are steadily working away in this direction, and it is highly probable that in time uniformity in the collection, distribution and sale of raw hides and skins will be the outcome.

Paris Auctions.

The most important French auctions—and in some respects perhaps the most important in Europe—are the Paris monthly sales. These usually last three days, and something like 30,000 hides and 40,000 calf skins are offered and sold, buyers attending from all parts of Europe, and many of them having large commissions to execute at times on American account. The hides are graded up into heavy ox, medium ox, and small ox, cows being scheduled as heavy cow and light cow. Other classes include light bull and heavy bull, medium calf, and light and extra heavy calf.

The Paris hides being sold in the green state, the quantities scheduled in the catalogues represent what each butcher is likely to produce during the coming month. In reality, the buyer buys for forward delivery, and by bidding for a lot, one is really buying a butcher's production of hides and skins for the next following month.

Bids are made for 100 half kilos, equal to about 100 lbs. English, and the bids advance by quarter francs. The catalogues show what prices were obtained for each lot at the preceding month's auctions, a useful guide to prospective purchasers.

Many of the hides taken off in Paris are from public abattoirs, and are, in consequence, well flayed and treated. The usual run of hides are very spready, but are well grown, and are bought chiefly for the manufacture of carriage leathers and high grade belting leathers. France, being also a large veal consuming country, is a large supplier of calf skins, and French square-trimmed skins are well known all over the world where a fine and well-patterned skin is required for upper stock, book binding or high class leather manufacture generally.

Sales to America.

Naturally, Paris hides and skins are fully appreciated by American tanners, and when the price is favorable, almost the entire offering is bought up on American account. The business done is at times worked through dealers, but this is often very unsatisfactory to tanners, as when an unscrupulous dealer is unable to obtain the genuine Paris slaughter, he at times ships country hides and skins, faked up to resemble the Paris goods as much as possible. The better plan is to buy through a broker who, for a small commission, will secure just the right kind of hide or skin required. These brokers, by the way, also look after the salting, curing, and shipping, any in many ways study the interests of their clients in a way which is a very direct money saving proposition.

Notes on German Hide Cure, Etc.

Of late years the thrifty Teuton has paid special attention to various methods of hide cure and distribution, with excellent results. A good general outline of the careful methods followed may be gathered from the rules for flaying and salting laid down by the Union of Thuringen Tanners, which are as follows:

Thuringen Rules for Take-Off.

Every hide is to be flayed from the beast direct into a basket beneath. Here it is left to drain and cool. Flaying into a basket has the advantage that the grain side remains quite clean and dry, and thus blood spots and other damage is avoided. For beating out the hide, special rounded hammers are used, which make any damage to the hide by cutting impossible. All hides are to be salted as soon as possible after cooling, in any case not later than the day of flaying. For this they are, after being cleaned from any adhering dirty matter, laid flat, spread out flesh side up on a low stretcher, which is higher in the middle than at the sides, and every part of the flesh side is sprinkled with about 25 per cent of green weight of salt.

Heavy parts of the hide, such as the head, are specially well salted, and the slightly stuck together edges are to be opened out and carefully sprinkled with salt. Too much salting never hurts.

The underside must be so arranged that all the salt water can flow away easily without soiling the lowest hide. In this way 100 to 150 hides can be easily laid one upon the other. The heads are not placed one upon the other, but laid near each other alternating above and below. By heavy salting a layer is formed under which the blood, water, etc., can easily run away without soiling the grain side of the hide lying next above. If the hides are sufficiently well salted, they can lie on the pile for a whole week and take no harm. Hides or parts of hides which are not salted stiff after two days, or on which no more free sale is to be found, must be resalted.

As blood, and the liquids of the hide, decompose in warm weather at least within a few hours, and in this condition are no longer fluid, so the draining off of the fluid of the hide and therefore proper preservation by the penetration of a strong solution of salt into the center of the hide is impossible if salting is not done immediately after the hide has cooled.

The firmer and stiffer the hide becomes on the pile, the more fluid is drained from it, the better it is preserved, and the better is the resulting return in hide substance and leather.

The salting and storing must take place in a cool place. The hides must be protected against draughts and sunshine to avoid drying up. Direct sunlight favors the commencement of decomposition. On dried-out spots the salt crystallizes out and makes in conjunction with blood salt spots, and the so-called "salt eating," *i. e.*, small holes on the grain side, which greatly reduce the value of the hide.

After 4 to 6 days, when the hides are "salt hard," they are bundled up and tied. It would be wrong to tie the hides up into bundles immediately after salting; the undrained-off water would remain in the hide and no proper preservation would ensue. The grain side would be soiled by blood stains and "salt-eating" would arise. Before salting the hides must be protected from frost and freezing, which alters the fibre texture mechanically, and later causes a weak, porous leather. Salted hides are not so susceptible to frost, because a saturated solution of salt only freezes at a very low temperature.

Calf skins are to be salted in the same way as hides. They are also laid upon each other flesh side up, carefully salted and left lying 3 to 4 days. In packing in bundles each two skins can be laid flesh side together. For salting only fresh unused salt must be used.

As a denaturing agent, alum is to be avoided, as it partially tans the skin and makes difficult the proper softening and slacking, and frequently causes spots of calcium sulphate which renders unhairing impossible.

The most useful method of denaturing is with a quarter per cent of petroleum, or about three per cent of calcium soda. This latter seems to be the best, as petroleum or petroleum residue, if not well mixed with the salt, causes greasy spots on the hide which lime cannot touch.

Italian Hides and Their Treatment.

The Italian hide trade is an important one, and for certain purposes, such as high grade sole leather, Italian hides are second to none, especially those obtained from Northern Italy. Of late years, a good deal of trouble has been caused by the materials used in connection with the denaturization of the salt used, a process rendered necessary by the fact that salt is dutiable in most European countries. This question was fully discussed at the Turin conference above mentioned, when a useful paper on the subject was read by Dr. Baldracco of the Royal Italian Tanning School, on a series of experiments and observations made by himself and Sig. Camilla Romana. The experiments were undertaken in consequence of appeals made by several hide and skin associations in France, when the investigators were empowered to investigate the causes of so-called salt stains, and to endeavor to find methods which would lead to their prevention. After fully investigating all the work previously done in connection with the matter, the investigators came to the conclusion that the gist of the question could be summarized by the following two queries:

Causes of Salt Stains.

(1) Are the so-called salt stains produced by the decomposition of various matters, such as blood, albuminoids, etc., which exist in the hides themselves at the time of salting?

(2) Are the so-called salt stains produced by the mixture of substances contained in the salt itself, or are they contained in the materials used in the denaturing of the salt?

The investigators, it appears, confined themselves to the second question, as they hoped that the first would be investigated by those competent, whilst the second would be of most practical value to the tanner. Admitting that the salt most suitable for hide preservation was sea salt,

they devoted their attention to a long series of experiments, the results of which are herewith appended.

Report I.

Salt Denaturing.

The formulæ for salt denaturing, furnished by the Italian Minister of Finance on the conclusion of the deliberations of the council appointed for the investigation of the matter, were as follows :

- (a) Sodium sulphate of potassium chloride 10 per cent
- (b) Alum, or any other substance such as
 aluminum sulphate..... 15 per cent
 Petroleum 0.25 per cent

The Technical Council for Salt, however, rejected the proposal to reduce the amount of sulphate of sodium for denaturing to 5 per cent, and forced them to the conclusion that the different substances such as sulphate of sodium, aluminum sulphate, alum, etc., which would not be allowed as denaturing materials alone, must be mixed with petroleum or naphthaline before use.

The Italian Tanners' Association offered an objection to the use of alum or aluminum sulphate, whilst they admitted as acceptable sodium sulphate and potassium chloride. The investigators then tried the effect of the addition of borax, using the following formulæ for denaturing in experiments on salting :

- (1) Common salt not denatured..... 15 per cent
- (2) Sulphate of sodium..... 10 per cent
 Petroleum 0.25 per cent
- (3) Potassium chloride 10 per cent
 Petroleum 0.25 per cent
- (4) Sulphate of sodium..... 5 per cent
 Petroleum 0.25 per cent
- (5) Sulphate of sodium..... 5 per cent
 Naphthaline 1 per cent
- (6) Borax 10 per cent
 Petroleum 0.25 per cent
- (7) Borax 10 per cent

In their report the experimenters state the skins were covered uniformly with salt and allowed to lie in pile for 48 hours, folded in the usual manner and allowed to remain for a month. After the expiration of this period, they were closely inspected, washed, and placed in a lime to which sodium sulphate had been added. After unhairing, fleshing and deliming, the skins were again carefully inspected and the following results were noted:

Denaturing

Agent as Above.

Character of Pelt.

- | | |
|-----|---------------------------------------|
| (1) | Blue spots on flesh and grain |
| (2) | Blue spots and faint blue shades |
| (3) | Blue spots and strongly marked shades |
| (4) | Blue spots and shades. |
| (5) | Blue stains less marked than 2 and 4 |
| (6) | Blue shades very slight |
| (7) | Blue shades more marked than 6. |

The conclusions drawn from the above were as follows:

(1) The causes of the characteristic blue stains must be looked for in the salt itself (Experiment No. 1).

(2) By the use of salt denatured by the use of potassium chloride, the blue stains are less than is the case with denatured salt.

(3) The use of salt denatured by the use of sodium sulphate, the stains were still less.

(4) Where borax is used for the denaturing of the salt, the stains were very slight, consisting of light blue shades, and no pronounced spots.

The investigators in their report called attention to formulæ 6 and 7 for denaturing, and to the fact that the spots remained throughout the whole tanning process. The light shades, however, vanished almost completely in the first acid liquors of the vegetable tannage, and in the pickling process which preceded the chrome process. The conclusions arrived at were that preference must be given to borax for denaturing materials.

The work described in the above report was continued,

and experiments were made with denaturing salt with potassium bichromate, whilst experiments were also made with salting with especially pure salt. This latter was made in ordinary way, greater care, however, being taken in purification, contact with iron vessels being avoided.

Experi-

<i>ment.</i>	<i>Salt Composition.</i>	<i>Observations on Pelt.</i>
8.	Purified common salt not denatured	White flesh and grain, with light spots on the flesh
9.	15 per cent refined table salt	Same as 8
10.	15 per cent purified salt denatured with 0.017 per cent potassium bichromate, 10 per cent sodium sulphate, 1 per cent naphthaline.....	White flesh and grain, light shade on flesh
11.	15 per cent purified salt denatured with 0.017 per cent potassium bichromate, 10 per cent sodium sulphate, 1 per cent naphthaline, 5 per cent borax	Flesh and grain very white and no coloration

The first experiment confirmed the previous statement, that the main cause of the salt stains was to be found in the salt itself, as the use of purified salt almost caused the stains to disappear. Experiment 10 showed that the formula proposed by the Government should be given the preference. Experiment 11 confirmed the preliminary results in regard to the beneficial results likely to be obtained by the use of borax as a denaturing agent. The investigators came also to the conclusion that when a

pure salt is used, the No. 10 formula was a suitable one for the denaturing of salt, the use of borax being allowable for those who desired it.

The above data was read at the Turin Conference of the Leather Trades, and its provisions received much consideration from the chemists and tanners present. Amongst the official resolutions passed was one suggesting that in the cure of hides and skins the quality of the salt used should come before everything else. Only such salt should be used in the manufacture in which the greatest care and cleanliness had been used, avoiding any which had been made in any plant containing iron. If these conditions are granted, the really important point was the use of borax for denaturing salt in all processes for salting hides, as all the experiments made had shown that the use of borax for denaturing salt were the best means for avoiding salt stains on hides and leather.

Belgian Hides and Skins.

A rather important paper on The Improvement of Hides and Skins was also read at the Turin Conference by Mr. Emile Kemp, who attended on behalf of Belgian Leather Manufacturers' Association. In this he drew attention to the fact that the Belgian Bourse aux Cuirs had since its foundation in 1906 largely interested itself in the question. After pointing out that the increased uses to which leather was put had greatly changed the character of the article required, and that the most clever tanner could not turn out good leather from bad raw material, he went on to draw attention to the defects caused by the warble fly, barbed wire fencing, the presence of dung and dirt and the effect of bad flaying and cuts. An attempt was made, it was said, in 1907 by an exhibition of hides, skins and leather to direct public interest toward the damage done by the causes just mentioned and so much interest was evoked that further steps were taken in the direction indicated. A press campaign was instituted, and a second Conference called in June, 1909. In 1910 the Bourse aux Cuirs again had a fine

exhibit of hides, skins and leather at the Brussels Exhibition showing the damage done by warbles, wire fencing, bad flaying, etc., and although this exhibit was unfortunately burnt, it served to create a great interest in the matter throughout the farming, grazing, butchering, and tanning industry. A good deal of literature was also distributed in connection with this subject at the exhibition, no less than 5,000 pamphlets being given away, drawing attention to the improvements in flaying when beaten off the carcass with a hammer or mallet. As a matter of fact the Belgian Bourse aux Cuirs has spent in four years about 10,000 francs in connection with the agitation for an improvement in connection with hides and skins, and the Bourse has stated in the trade press that if other trade associations would take the work up as well, there would soon be a vast improvement in the take off and quality of the world's supply of hides and skins. Even now butchers' cuts in hides are gradually vanishing in Belgium, whilst the example set by this industrious little country is steadily being followed by France, where in many cases flaying by the hammer is being followed out with excellent results. In regard to flaying by the hammer (*la dépouille au marteau*) it will be interesting to give here a translation of the instructions and a reproduction of the diagrams issued by the Bourse aux Cuirs of Belgium.

Diagram 1.

The beast is placed on its back and the hide is removed from the legs, which are then hooked together. The opening of the hide is made in a straight line above the knee and toward the beast to a length of about three centimeters below the breast.

Diagram 2.

The beast is now placed on its back with the legs skinned and tied together. An opening is made in a straight line from the point of the chest in the direction of the root of the tail. If the plan indicated in the figures

1 and 2 are followed out, a hide of perfect shape will be the result, as shown in diagram 4.

Fig. 3.

The illustration shows that the flaying with the hammer is easy and simple. After the hide is removed from the flanks, so as to get a firm grip with the pincers, blows are given between the hide and the flesh, and not only is a perfect hide obtained, but there is no resulting injury to the carcass or meat.

Diagram 4.

If the directions given in figures 1 and 2 have been followed out, a fine shape will be obtained, whilst there will be no damage to the edges as shown by the dotted lines. By the use of the hammer it is impossible to cut hides, whereas these are almost impossible to avoid when the flaying knife is used.

Much attention has also been paid to the damage done to hides and skins in Denmark, and extensive trials have proved that the best results in regard to the destruction of the warble or grub in cattle are obtained by the removal of the larvæ from the back of the living animal at the proper seasons of the year.

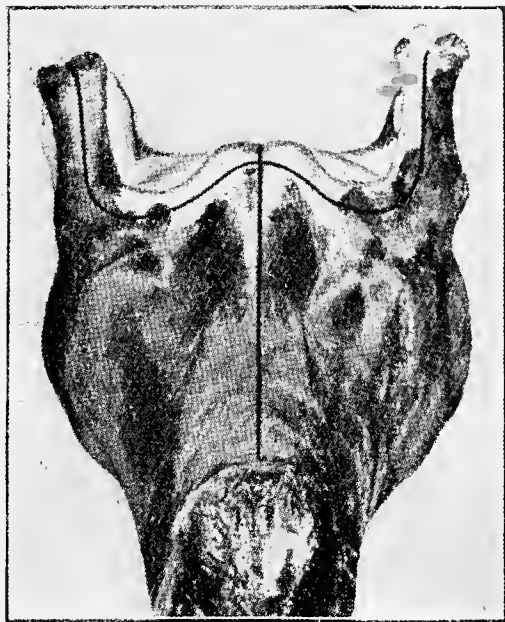


Diagram 1.

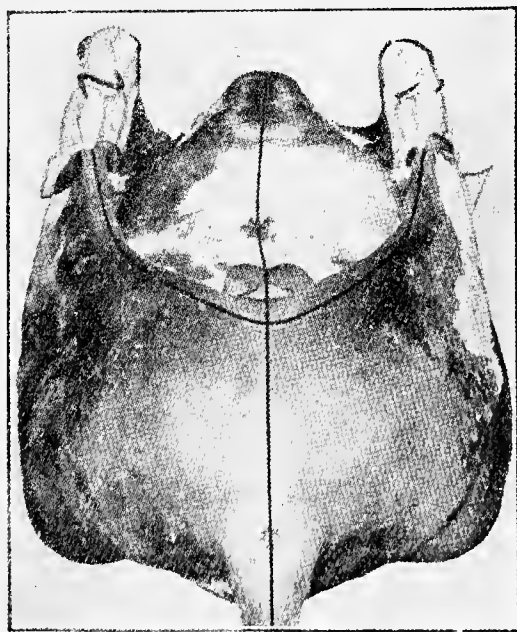


Diagram 2.



Diagram 3.

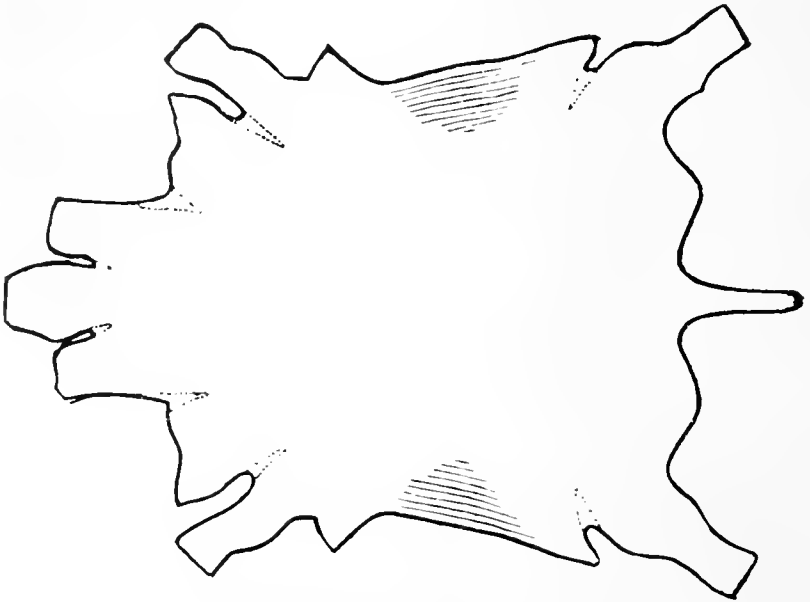


Diagram 4. A Perfect Hide.

SOUTH AMERICAN HIDES

The southern half of the western hemisphere furnishes to Europe and the United States a large quantity of wet salted and dry hides. In recent years American tanners have used wet salted hides more freely and are beginning to know their real value, compared with domestic stock.

South American wet salted hides are of three classes, viz., frigorificos, saladeros and mataderos.

Frigorifico Hides.

The frigorifico class is of the highest quality and is taken off similar to Chicago packer stock, but is not so well flayed. The labor conditions are not stable, the men shift around, causing variation in the take-off—sometimes better and again poorer—but mostly it compares favorably with the best packer hides. The slaughterers kill largely for the European markets. They dress domestic cattle interbred with finer stock similar to American free-of-brand beeves, although still containing some of the creole or original range blood. The hides coming from a warm climate are much like Texas stock. The hides are plump and the fiber open, and they absorb more tannin and produce very firm leather.

Salting, Disinfection and Trim.

Frigorifico hides are salted in the same manner as American packer stock, but are trimmed much closer and washed on both the hair and flesh sides before going into pack, and therefore are very clean. They are cured with coarse mineral salt, which leaves the hides in a white condition. The hides, after being

washed, go into a pickling vat containing strong brine with five per cent bichloride of mercury, to meet the requirements of the United States government. After being in pickle for twelve hours, they are withdrawn, put in a pile, drained off and salted. The pickle extracts the animal juices from the hides more quickly than when they are salted in packs green from two to three weeks. For this reason frigorificos cure much faster than American packer hides.

Saladero Hides.

Saladero hides are from creole cattle, or those not interbred, resemble old-style Texas steers, are very thick and plump and have one to four brands. The brands are small, generally on one butt. Saladeros are not as well taken off as frigorificos, but are capable of producing, at the same prices, better results, because they make a larger yield of leather. They are suitable for sole leather only and in past years were tanned mostly in Germany, France and Italy. During recent years a great many have come to the United States, as our tanners realized their value, compared with domestic stock, and know how to handle them. These hides are cured the same as frigorificos, but are not so clean of flesh.

The mataderos are of the same stock as the saladeros, but are taken off by country butchers. The take-off and cure are a good deal poorer and class with American country hides.

Prices and Sales Methods.

The values of South American wet salted hides are based on frigorifico steers. The saladeros sell on a par with the frigorifics nearly all the time. The mataderos bring from 1½c to 2c below saladeros on account of their poor take-off and cure.

Saladero and matadero killers are located through the country in small places and would class with American small packers' establishments. The labor

in these districts is very uncertain, hence the poorer take-off.

Hides are sold flat, no selections being made for weights: They run very uniform, from 50 to 75 pounds average; in the summer season 57 to 60 pounds, and in the winter season 60 to 67 pounds.

The seasons in South America are just the reverse of the northern continent, summer here being winter there. The climate is about the same. The winters are not so severe—they never have snow—and, therefore, the cattle do not get so long-haired and unhair more quickly in the spring, so that the short-haired season is about two months longer than in North America.

Calfskins are graded at 7 to 15 pounds and kip at 15 to 25 pounds, the same as American weights. They compare favorably with the hides, the cure and take-off being equal.

Dry Hides.

There are many varieties of dry hides in South America. Buenos Aires, Entre Rios, Montevideos and Cordobas are the stable selections. They are all taken off on the range. Many of the cattle are killed for immediate consumption, while some die through the winter season, the hides being preserved while the meat is wasted. The hides are sun and air dried and in many districts are poorly taken care of. A good many lots run very poor, while others run good. They are shipped to the markets in Buenos Aires, Montevideo, etc., their names being given as of the port of export, in original lots and are sorted up. Very bad gluestock hides are removed. They are then graded for heavy hides, 14 to 16 pounds and upward, the average being 22 to 24 pounds, although sometimes as high as 26 to 28 pounds. They are then sorted for No. 1's, No. 2's and No. 3's, and each hide is marked according to the exporter's individual method. Some have Nos. 1, 2 and 3, while others use letters in designating the various grades. The No. 2 hides

are called "desechos" in Spanish, and the No. 3's, "maldezechos." The hides are sold on a flat basis, to run a uniform percentage of No. 2's. Buenos Aires and Montevideo hides are usually sold with 20 to 30 per cent seconds specified, while Entre Rios are always sold free of kip and glue hides, or 14 pounds and upward.

These hides usually are sold on the same selection for heavy and light stock, specifying 15 to 20 per cent seconds. These are the highest priced hides that come from South America. They class for quality in this order: Buenos Aires, Entre Rios, Montevideos and Cordobas.

Damage by Ticks, Etc.

South American hides are all more or less ticky, depending upon the section in which they originate. Some are very ticky, while others are less affected. In buying dry hides the tanner has to contend with damage from sunburn. Winter, fall and spring hides are the best, while summer stocks are the poorest. This is because of sunburns, which injure the grain and oftentimes cause hides classed as No. 1 to be put into gluestock. Such hides were injured in drying, but the damage does not show until they are put into the limes and soaks.

Kip and calf skins are graded the same as in wet salted stock and are sold as to quality on the same selections.

The terms on dry hides are the same as on wet salted stock. Sole leather tanners have bought these hides for many years, are familiar with them, and are buying them constantly.

Hides coming from the western part of South America, such as points in Peru, Bolivia, Ecuador and Columbia, are classed about the same as those mentioned above, and come largely in dry stock; very few, if any, are wet salted. Some are dry salted, which means half dry. Their values are based on North and South American hides.

America gets from South America only the surplus. The European countries have imported these hides for years, or since the raising of cattle began, and they are their main supply. They usually buy what they require and the surplus comes to America. This condition applies to the hide and skin surplus of the world.

How Hide Trades Are Financed.

Hides are bought mostly on letters of credit, three or four months, letters being issued through American bankers and their London correspondents and the rate of exchange is based on \$4.86 per English pound. Orders are given for a quantity of hides, of a certain packer. They are cabled there and the purchases made and reported to the tanner, after which the letters of credit are issued, in the name of the party making the purchase. The hides come forward in thirty to fifty days, according to whether the vessels are fast or slow.

All hides are sold cost and freight New York or Boston, when destined for America, which means that the freight and all costs in South America are paid by the seller. When the hides land they are at the risk and expense of the buyer, who usually has a public weigher receive, weigh and ship them at his (the buyer's) expense. The insurance is also paid by the buyer, as all bankers require an insurance policy to cover the letters of credit in their name to insure safety. This financing is done at a low rate of interest through London, and the bankers are very careful that the loan is secured by the goods until they are delivered to the buyer. Buyers who are responsible can get these letters at three or four months, and sign trust receipts when the hides arrive and pay the draft when it matures. The charges for such letters of credit through good bankers are usually $\frac{1}{2}$ of 1 per cent for three-month letters and $\frac{3}{4}$ of 1 per cent for four-month letters. Some of the smaller bankers charge higher for these letters.

Hides are usually sold in advance of the kill. South

American packers operate on the buyers' money all the time. They sell their meat and offal before they buy the cattle, giving the bankers a guarantee to produce the goods or settle for the difference in value at the market value at the time of delivery. This business was started and built up in this way by people who did not have much capital, and still continues along the same lines. The methods will, no doubt, change more or less as American packers get into the South American markets.

MEXICAN HIDES AND SKINS

Cattle hides of Mexican origin are desirable and of good quality owing to the general absence of disease among the animals of that country. The cattle are smaller than the average in the United States, but their hides are tough and very desirable for sole-leather purposes. Mexican hides are somewhat on the order of Texas steers and cows of former days, when the vast herds roamed unprotected from the weather. Goat-skins form the greater part of the supply of material for making leather from Mexico, owing to their general use as a farm and dairy animal.

Much difficulty has been met with in endeavoring to raise pure-bred cattle, horses, etc. Many years ago large herds were imported into the country in an endeavor to raise the standard of beef and draft animals. Experience, however, proved that the rough and unsheltered life was too much for the well-cared-for animals. Better results were obtained subsequently by the importation of pure-bred males only. The animals brought into Mexico are more subject to anthrax and cattle ticks than the native beasts.

Slaughtering.

Cattle are slaughtered by well-to-do farmers on their ranches. Killing is also done by butchers, who take the animals to the municipal slaughter houses for this purpose. The Mexican government of late years has assumed control of a line of large slaughter and packing houses. From these plants the best flayed hides come. As a usual thing, the hides taken off by the farmers and butchers are dried to preserve them, while abattoir stock is salted, much the same as in the United States.

Methods of Drying Hides.

Hides are dried by exposing them to the sun, or in shaded sheds. The hides are hung on poles or wires, flesh side out, the fold being down the center of the back. Sun-dried hides are liable to harden on the flesh and not allow the moisture underneath to evaporate, while the shade-dried are preserved in a uniform manner all the way through. No salt is used in preserving dried hides. After the hides have been thoroughly dried, they are given a treatment of poison. This preparation is made of either a solution of arsenic or cyanide of potassium. The purpose of this application is to free the hides from destructive insects which ruin them by eating the hide substance. The poison is applied by sprinkling it in the hair, which is the abode of the bugs, as they are commonly called.

Classification.

There are two classifications of dried hides. Flint hides are the hides of cattle which have been slaughtered, while murrain or fallen hides come from dead animals. Flint hides have a bright, live appearance, while the fallen stock has a dead and dull appearance. Dry hides are put up for shipment in bales of easily handled size, the number to a bale being governed by the class and weight of stock being shipped. They are placed one on top of the other, legs in and backs out, there being backs but no legs showing on the outside of the bales. Hides are piled in a compress, and, when a sufficient number have been piled, they are pressed in a tight, compact bale and bound.

Wet Salted Hides.

Wet-salted hides are treated in much the same manner as packer hides in the United States. They are placed in packs built to retain as much pickle as possible. They are left lying in salt for thirty days to thoroughly purge them of blood and foreign animal

matter and then taken up, classified, bundled and shipped. Mexican wet-salted hides are branded and are generally sold in but two classifications—cows and steers—with the various weight selections, as to demands of buyers. No poison enters into the curing or preserving of wet-salted hides.

Goatskins.

Goatskins are classified as "Matanzas" and "frontiers." The former are those that weigh 800 grams (1.763 pounds) or over, and are of standard shape, and well taken off. Those that do not come up to these specifications are classified as frontiers. The matanzas skins are dried without using salt, after which they are poisoned, similar to the dry hides and rubbed with talcum dirt. Talcum dirt is found in many sections of Mexican country and is a substance closely resembling clay, being more commonly known as clay dirt. The frontier skins are dried without salt and subjected to immersion in clay dirt, but are not poisoned, the latter operation being eliminated in preparing the poorer quality skins for the market, or when only small lots are involved.

Deer, Hog and Slunk Skins.

Deerskins and wild hogskins are dried without salt and are not poisoned. Skins of the unborn calves, commonly called slunk skins, are taken from the cows when slaughtered and dried with salt, and poisoned, good care being taken with them owing to their desirability for use in making the better grades of gloves.

General Absence of Cattle Diseases.

Anthrax seldom appears in the sections of Monterey and Vera Cruz, from which ports a large part of the output of goatskins is shipped, and only a very limited number of cases have been found for several years past. Those cases discovered were almost entirely

among the imported animals. The remedy used is to kill the animal affected and burn the carcass, so that the disease does not spread. Ticks are known throughout the Monterey district, but can easily be controlled by furnishing the animals with plenty of salt. The district of Vera Cruz is not seriously affected by the prevalence of tick, and, as a rule, only imported animals suffer. In the interior of the country, where an altitude of 5,000 feet or over is reached, ticks do not exist.

HIDES AND SKINS OF AUSTRALIA

By WALTER HAYNES

Australia is a great hide-producing country, the number of cattle increasing at a great rate during the "good seasons." Unfortunately for the "squatters," as well as the dairy and other farmers, the country is visited periodically by droughts, which carry off many thousands of cattle and sheep by starvation and thirst consequent on want of herbage and water, through lack of rain, the country being turned in a few months from a paradise of vivid green to a barren desert, and the cattle from fat, sleek, well-contented animals to miserable, well nigh starved bags of bones.

The hide supply is obtained from several sources, foremost being the great "squatting" or cattle-raising industry. Some of the larger "runs," thousands and tens of thousands of acres in extent, carry great numbers of cattle during the good seasons and from these are drawn the beef supply for the different colonies, and also the vast amount of chilled meat which is exported to Europe. The cattle are either driven by road or carried by rail to the larger centers of population, such as Sidney, Melbourne, Adelaide, Brisbane, etc., where are situated the large killing and chilling plants of the different colonies, where the cattle are slaughtered and the surplus which is not wanted for local consumption is chilled for transportation to Europe.

Abattoir Hides.

The hides from these "abattoirs" are the very best in the colonies, usually being beautifully flayed, well salted, and coming into market in a very fine state,

practically free from cuts, blood and dirt, which cannot be said for many small lots of country butcher hides. The hides from the abattoirs are usually eagerly bid for at the public auctions, where the great bulk of the hides of the country is sold, by the tanners and shipping agents. The hides are sent into the auction rooms in Sydney, Melbourne, etc., and are classified into firsts, seconds, cuts; also different weights, as 60 pounds and over 60 pounds, 55 pounds, 50 pounds, 45 pounds, and on down to yearlings, wet salted, dry salted and dry.

Dairy Hides.

The dairying industry has made such tremendous strides in Australia of late years that it has become quite a factor in the hide trade, whole districts in each of the colonies being almost entirely given up to dairying, and instead of each farmer making his own small quantity of butter each day, he now sends his milk to the central factory, where it is tested and he is paid for it according to the percentage of butter fat contained in his milk, the butter being made altogether and so kept at one standard of quality. These thousands of farmers driving to the central factory each day bring in hides from cattle that have been slaughtered after fattening, or from cattle that have met with accident, such as getting into bogs, trees falling on them, getting swept away by floods and only recovered for the hides; or, during droughts, from cattle that are not considered valuable enough to feed artificially and so keep alive at great expense.

These hides are usually sold to local storekeepers from whom the farmer buys his stores and are taken in part payment of the month's account. They are salted by the storekeeper and are either sent to the nearest hide auction or sold to dealers who scour the country in search of hides, and who in turn either sell to tanners direct or send to auction.

From these dairying districts come the greater majority of calfskins that are sold at auction or tanned

by local tanners. Dairymen or dairy farmers usually kill off the bull calves soon after birth, unless they are from prize stock, when they are reared for stud purposes, often realizing big prices.

Farmer Hides.

The ordinary farmer also enters into the hide supply. He usually keeps a few cattle for supplying his family wants and, perhaps, those of a few neighbors, killing enough to furnish them with beef, and milking enough cows to supply them with butter and milk. It is a very animated scene that meets the eye of the visitor to the hide auctions in the large centers of Australia, where the tanners and shippers of hides strive to secure each lot against keen competition.

Australian Sheep.

The sheep of Australia, being almost entirely of the Merino breed, are very small and are bred for the excellence of the wool, the skin being of quite a secondary importance. This Merino wool is the very finest in the world and is a great source of wealth to Australia. Sheepskins are exported in great numbers, usually in the pickled state, also as basils.

Australia is not considered a great fur country, although some furs are got from there, viz., the opossum, which is a very finely furred animal, the skin of which seems to be used more extensively in Europe of late years. Rabbit skins, of course, are exported in many millions from Australia. These animals, which were imported from England, have become such a scourge that whole tracts of country have been ruined by them, but some slight compensation is being sought in the exporting of these millions of skins, from which many kinds of the more expensive fur skins are imitated by the furriers of Europe and, doubtless, of America. The kangaroo is an animal wearing a valuable hide for shoe purposes, also for bookbinding and other things where light skins are used.

DANISH CALFSKINS

By VOLMER H. HOULBERG

Danish calfskins are among the best produced and are always in good demand in the United States. The skins obtainable in Denmark are mainly from Jutland and Sueland. Jutland calfskins come either green salted or sun-dried. The former weigh from five to nine pounds and are sold in two special selections as to weight, five to seven and seven to nine pounds. They are good, plump skins with a fine grain, are well taken off, have no meat and contain only about 40 per cent butcher-cut skins. The latter come from the country districts. The shanks are trimmed three to four inches below the knees and about 50 per cent of the skins are headless. The Jutland district produces about 125,000 calfskins yearly. All Jutland stock is two-colored. The greatest demand for these skins comes from Eastern tanners in the United States and it is estimated that about 100,000 skins are purchased by these tanners each year. They are used for both colored and black finished calfskins. They are considered better than most domestic skins and many tanners think them equal to the Swedish calfskins. Sun-dried calfskins range in weight from one and a half to three and a half pounds each and come into the market about 75 per cent stretched and 25 per cent unstretched. By stretching, it is understood that the skin, when first taken from the animal, was nailed to a wooden frame and dried. So far as condition is concerned, sun-dried are about equal to green salted.

Sueland calfskins come all sun-dried and weigh from one and a half to three and a half pounds each. About 10 per cent are headless. They are well taken off,

free from meat and without butcher cuts. They are large and spready, but thin and flanky and, of course, do not bring as high prices as Jutland stock. This class of skins is used almost entirely for the cheaper grades of shoe leather. They are all one-colored skins, red-brown, and are known as "red calf" among all native collectors. They all come stretched, and during the past few years a big percentage of the imports to America have been used for fur purposes, being less costly than pony skins, while just as good for coat stock. The wet salted skins come to this country in bundles of ten and the dried calfskins in bales of 120 to 125 skins. Calfskins from the large cities, such as Copenhagen and Denmark, are put in with the Jutland stock.

Vealskins.

In Denmark, vealskins are offered to the trade under two names, Danish veal and Copenhagen veal. Danish vealskins are selected from all parts of the country. In weight they range from 8 to 18 pounds. They all come with short shanks, tail bones and heads, only about 10 per cent being sold without heads. They have a very small percentage of butcher cuts, are rather flanky, but have a good grain. About 10 per cent of receipts are seconds. Copenhagen abattoir skins are all short shanks, tail bones and heads, except about 10 per cent, which are sold without heads. The take-off is much better than the Danish skins, and they are handled with more care. They are particularly free from butcher cuts and are all fine, clean skins. They sell at $\frac{1}{2}c$ a pound more than the Danish skins. The weights are the same, 8 to 18 pounds. If not purchased from reliable dealers, there is likely to be a large percentage of grasses in the Danish veals, while in the Copenhagen selections there are no grasses. Both Danish and Copenhagen vealskins are used principally in Germany and the United States. All veals are green salted, and come to this country in bundles, six to the bundle.

NEW ZEALAND SHEEP AND LAMB PELTS

In late years the trade in pelts from New Zealand has increased at a rapid rate. Both English and American tanners are using more pelts from New Zealand, which are said to be equal to those taken off in other countries. The supply is large and the trade with New Zealand is becoming an important adjunct to the sheepskin industry. New Zealand pelts are generally suitable for the requirements of both American and English tanners, but have their peculiarities.

For instance, lambs raised in the Province of Canterbury in the South Island of New Zealand are noted for their pelts of large spreading pattern with even substance. The Canterbury sheep pelts are mostly medium to light in substance, giving a medium to fair spread, and are most suitable for light work. The North Island of New Zealand is noted for producing some of the largest and best pelts exported from the country, most of these pelts being suitable for splitting and capable of giving in many instances 135 feet per dozen, producing also a perfect grain and flesh. However, there is a considerable loss due to the method of curing and treating by the sulphuric acid process.

Methods of Take-Off.

The skins are taken off the animals as soon as they are killed, and carefully washed. The wool is removed from practically all of the skins destined for the American trade and pickled for export in a solution of salt and sulphuric acid. The American duty on wool appears to make it disadvantageous to ship to the United States skins with the wool on. The wool is

loosened by several different depilatory processes, either by sweating or by treatment with caustic soda and sulphur or sulphide of sodium. Considerable of the wool so removed, chiefly that around the edges of the skins, is usually injured by the use of these chemicals, but this loss appears to be offset by a certain amount of increased weight in the pelts. As a rule, English trade seems to like the heavier pelts treated by chemicals, while the American trade prefers pelts from which the wool has been removed by sweating. In the New Zealand trade the term "pelts" always means the sheep or lamb skins without the wool. In the preparation of the skins before being pickled for export an ingenious American machine is used to scrape off all the fleshy surfaces. The demand for New Zealand lamb pelts from the United States is stronger than from any other country, and it is understood that the greater part of the pelts that go to London eventually find their way to the American market. The skins in addition to being tanned for sheepskin upper leather are valuable for bookbinding, pocketbooks, bags, etc., and also for substitutes for various fancy and high-grade leathers. The cities of Christchurch, Wellington and Dunedin are the chief centers of the export pelt trade in New Zealand.

CHINA HIDES.

China produces both a dry and wet salted hide that are in quality about equal to the South American hides. The lots vary, if anything, more than the South Americans, but the best cared for hides in China are very good, while the poorest are very poor. These all go to Europe first and after Europe takes its supply the surplus comes to America. The values of these hides are always governed by North and South American values.

RUSSIAN PONY SKINS

By VOLMER H. HOULBERG

Russia is the main source of supply of pony skins, largely used in the European and American trades. The yearly output averages about 150,000 skins, principally for furrier purposes, such as coats, leggings and coat linings. The skins come from 1½ pounds to 3½ pounds in weight. They are all flint-dried. In the summer they are dried out of doors in the sun, and in the winter are cured in drying houses by artificial heat. Winter skins are more or less long-haired and not as suitable for fur purposes as summer skins. The animals from which these skins are derived are seldom more than fourteen days to two months old when killed. The meat of the ponies is eaten by the peasants throughout the country. Those skins come mostly from the districts of Petropoul and a few from Moscow. The mains and tails remain on the skins. They are trimmed with long shanks and all have the heads attached. Petropoul skins come with short shanks.

The Selections.

The selections on which pony skins are sold are based on weights, the length of hair, glossy and moire-affected skins. The take-off is not, as a usual thing, good, as the skins generally have butcher cuts, which do not matter when used for fur purposes. No other people except the Russian peasants use the meat of these animals for food when so young, consequently pony skins from other countries are taken from dead animals, and, as they are badly handled, are only fit for whip purposes.

Most of the pony skins are sold at the Nijni Fair, which is held at Nijni Novgorod, two hundred and seventy-six miles from Moscow, where the Volga and Oka rivers meet, and situated in almost the exact geographical center of Russia. As a rule, the buyers are London dealers, who purchase direct from the collectors at the fair. The skins are shipped direct to England as soon as collected. They come in a dry state, a hundred and fifty skins to a bundle. These skins are generally well cured and are sold to American tanners on letters of credit.

Russia Colt Skins.

The principal producing sections for Russia colt skins are Petropoul, Tjumen and Siberia. They are taken from young horses from one to three years old. The meat, like that of the ponies, is used for eating purposes by the peasants of Russia and the poorer classes in some parts of Europe. The average kill each year runs from 400,000 to 600,000. Almost the entire output comes to American tanners. These skins are mostly flint-dried, with about 20 per cent brined before they are dried. The latter weigh more, but the strictly sun-dried are considered the best. The selections are according to weight, 7 to 8, 8 to 9 and 9 to 10 pounds. Each skin is allowed five butcher cuts. If there are more than five cuts, it is a second. Skins with very bad cuts and sweated skins are classed as thirds. The length of hair has nothing to do with the selections. These skins are used principally for patent leather in the United States. In some countries of Europe the butts are used for the heads of expensive drums. The skins purchased at the Nijni Fair are received in America in bales of forty skins each.

Colts or horses are raised in Russia the same as cows in America. The animals are herded the same as cows and most of the year are obliged to get their living by grazing. The peasants drink the milk of

the female horses and, when killed, eat the meat. The winter colt skins are long-haired.

Horse Fronts.

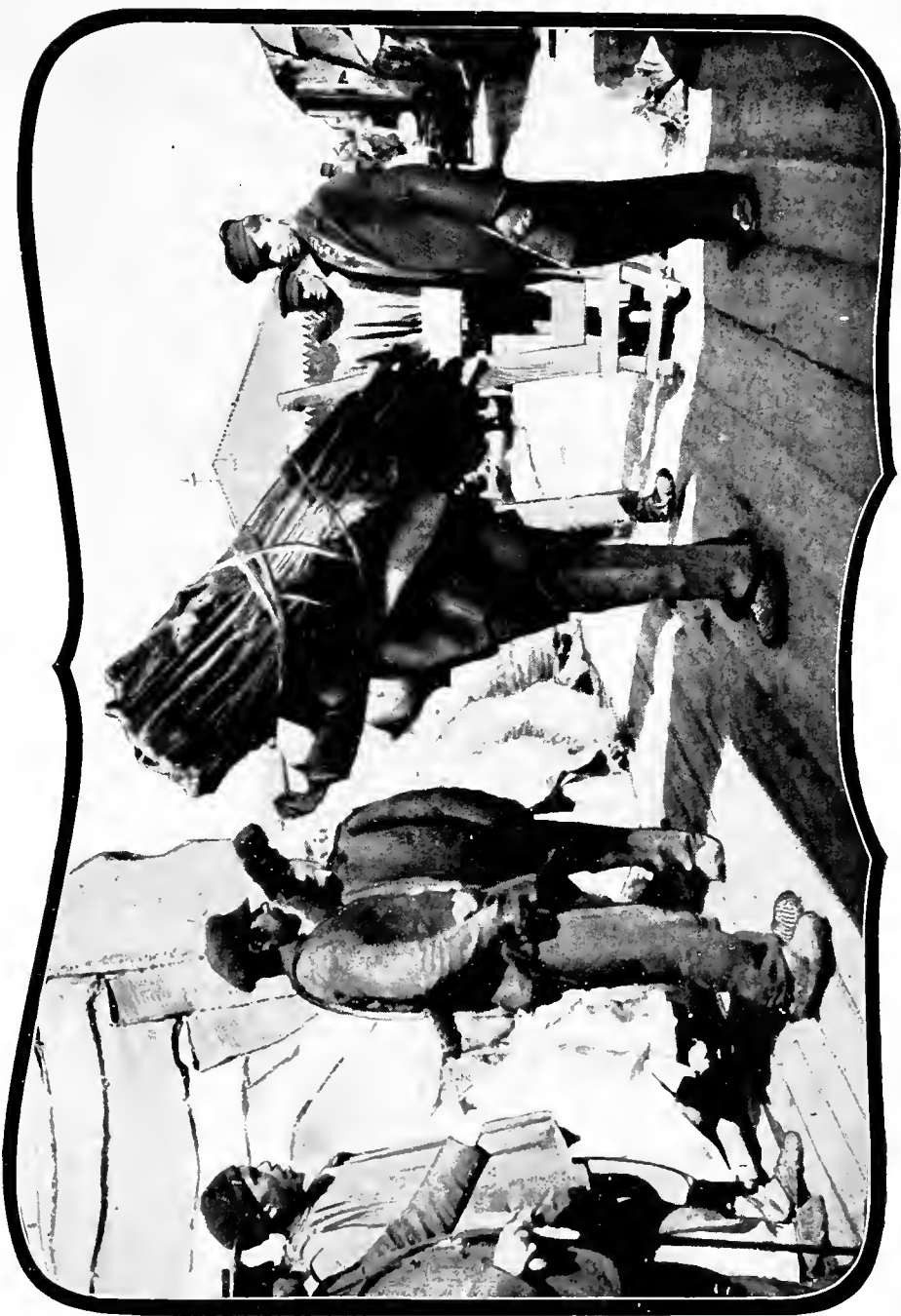
In Russia horsehides, the fronts only come to America, there being no demand for cordovan leather. The butts are used principally by German and Polish tanners. The hides come from the same districts as the colt skins and the selections are the same. Collectors separate the fronts from the butts. All colt and horse hides coming from Petropoul are of better take-off and are better cured than those from other districts. They always bring from five to ten cents more per skin. Seconds are sold for 20 per cent less than firsts, and thirds bring half price. This is true of both colt and horse hides. Fronts come in bales, thirty to thirty-five in each. All have heads on and long shanks. The heavier selections of both are the best sellers.

Scenes at the Nijni Fair

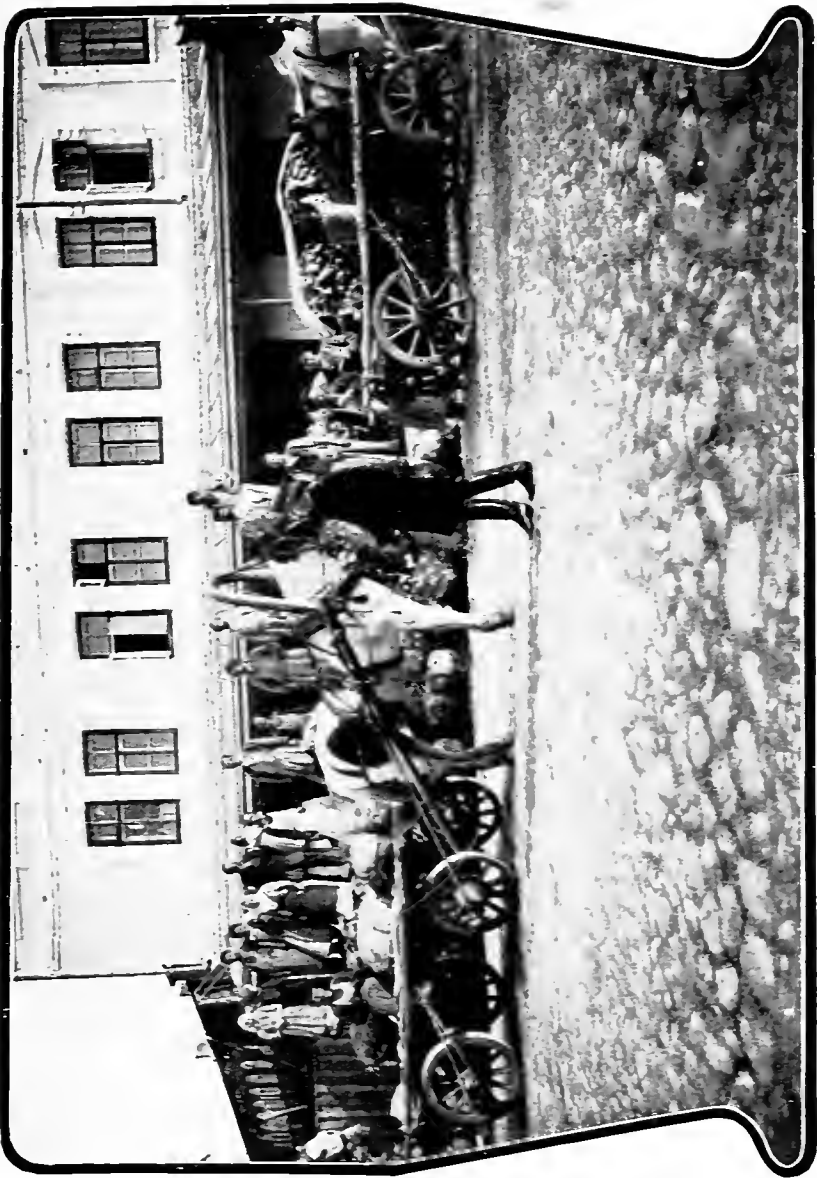
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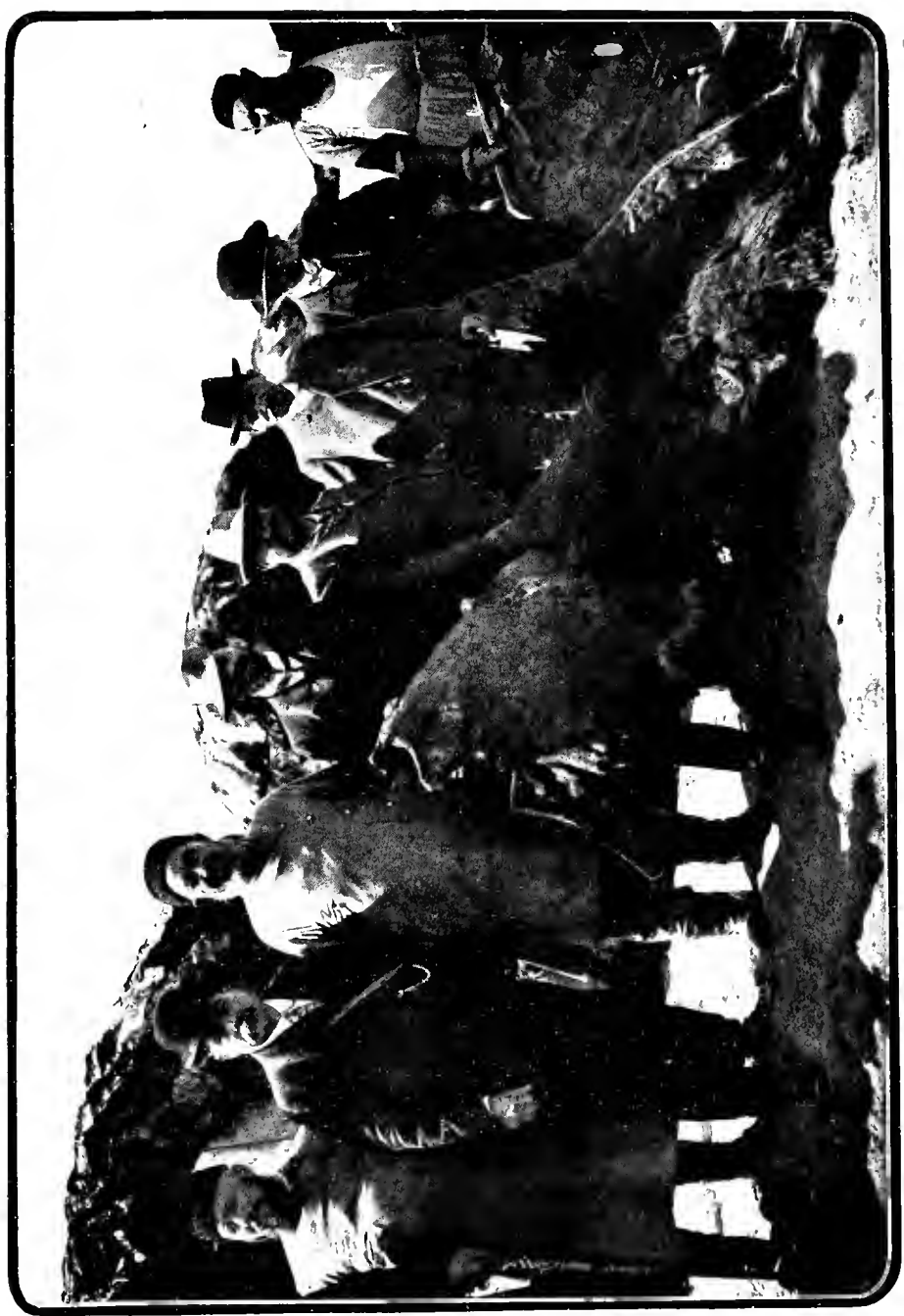
275 miles from Moscow, Russia

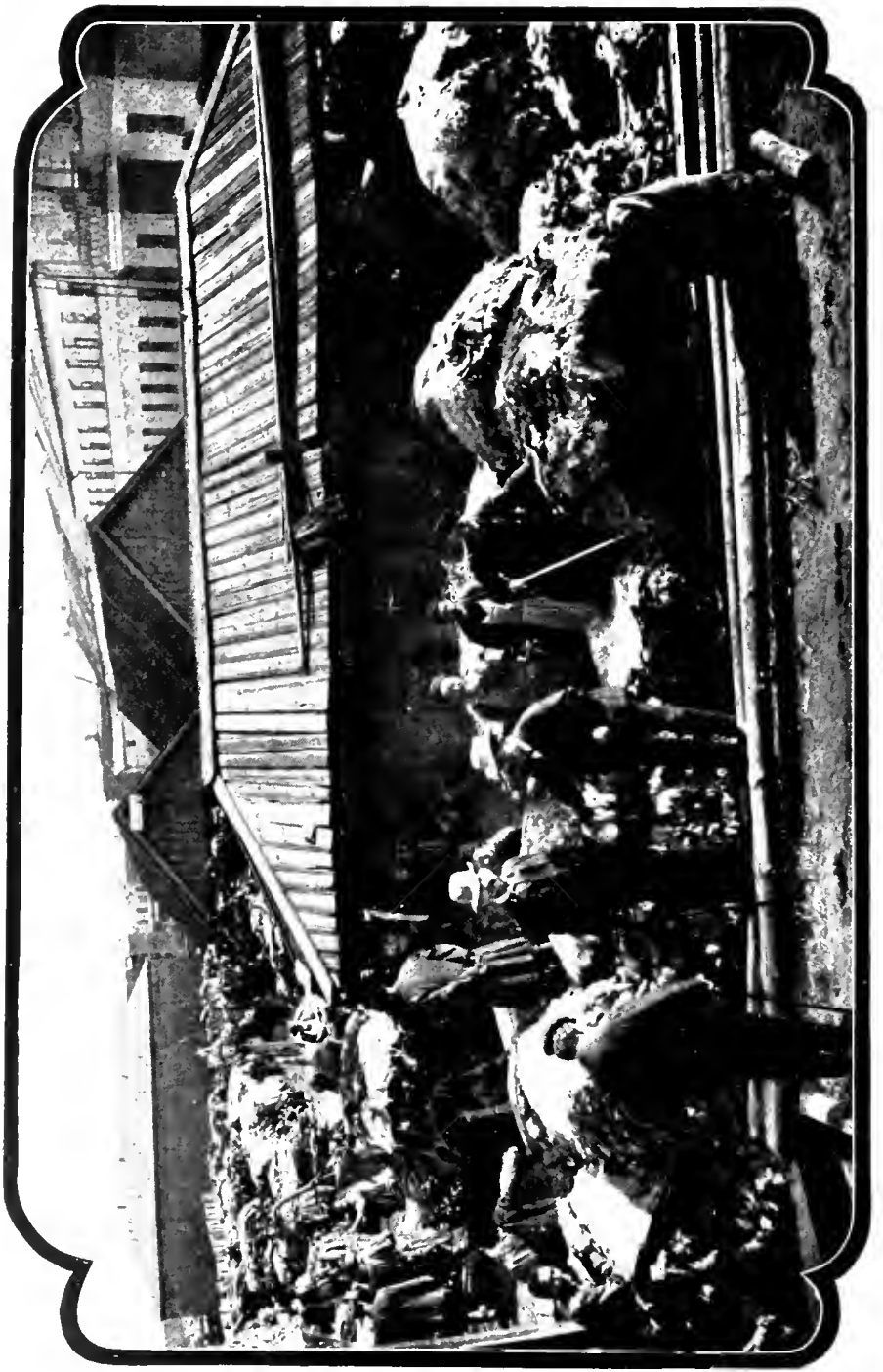












GOATSKINS

The skin or pelt of the common goat is a product which, outside of the trade, is not generally recognized at its true value. As a raw material it rates in importance among the chief imports into this country. Few people outside of the leather industry, however, are in any degree familiar with its uses.

These are rather varied, but for the most part goatskins are manufactured into a chrome tanned leather known as glazed kid. This probably consumes 90 per cent of the skins imported. Other uses which may be mentioned are for patent or enameled kid, and mat or dull kid. These leathers are all used for shoe purposes. But goatskins are also used more or less extensively for furniture, bag and pocketbook and fancy leather.

The Goat a Meat Animal.

Goatskins are gathered chiefly from those countries in which the meat of the goat forms an important food product, and the skin of the animal is a resultant by-product, though, to be sure, a very important one. In our own country, goat meat is not considered fit for human consumption, though we are credibly informed that considerable of it is sold in the guise of mutton and so-called Angora venison. For the reason stated, the United States produces only a small proportion of the vast number of skins which are daily put into process by manufacturers who specialize in transforming the raw goatskin into its various finished products.

Sources of Goatskin Supply.

The chief sources of supply are the Orient, Asia, Africa and South America. Nearly every country,

however, with few exceptions, exports goatskins in greater or lesser quantities to the United States.

As may be supposed, there is a vast difference in the character of the goat as it exists in each country. While these differences are clearly marked with reference to the country of origin, the peculiar characteristics inherent in the skin of the goat may be clearly traced and localized within a very small compass, geographically speaking, so much so, that in certain countries, goatskins originating in districts which are not more than fifty miles apart, have certain distinguishing features which plainly mark them one from the other. These characteristics are most often a result of the physical condition of the territory in which the animals are grown and pastured, and animals from one section, if transferred to a different one, will gradually assume most of the characteristics of the goats originally bred in the new habitation, though several generations may be required to accomplish this. On the other hand, the original breed of goats which have been transplanted in some foreign country can often be traced back by virtue of their retention of certain peculiarities.

Methods of Collecting and Preserving.

We shall here describe in a general way the methods employed in collecting, handling and preserving goatskins, as well as their general characteristics and susceptibilities, and shall later detail this information in considering each producing country under a separate head.

The following are the principal distinguishing features which mark the country and district of origin of the goat, as shown in its pelt: Size, pattern, length of hair, color of hair, and fineness of its texture; character of grain and the nature of its imperfections. The characteristics just enumerated may be traced even after the skin has been manufactured into leather, excepting of course length of hair and its color. It is quite possible, however, for experienced handlers

of goatskin leathers to form accurate conclusions respecting the kind of skins out of which a given lot of leather was manufactured. Other features which are most noticeable in distinguishing skins as a class while yet in the raw state are the manner in which the skin has been flayed from the animal, and its subsequent mode of preservation, commonly known as cure.

Methods of Curing.

The ordinary methods employed for curing are as follows: Sun drying, dry salting and wet salting. The first method is very simple, and consists merely of spreading the skins out or hanging them up exposed to the sun, or, in some of the torrid countries, preferably in the shade, until they are quite free from moisture. The second method is practically the same as the first, excepting that the fresh skins are first rubbed with salt before being dried. The third method necessitates a thorough rubbing of fine salt over the skins, which are allowed to remain moist and are folded into small bundles; that is, each skin separately, and then packed into casks. Certain advantages are claimed for each of these methods, though in general it may be stated that they are followed rather out of custom than for any other reason.

Collecting the Skins.

In most countries goats are not raised in large herds after the manner of our domestic cattle and sheep raising, but are mostly produced by reason of the individual ownership of one or several animals by the farmers or peasants. It can be readily understood that under such circumstances, countries such as India, China and Africa, with their teeming millions, produce in the aggregate vast quantities of skins. These are gradually gathered by small collectors, from whose hands they pass into those of the larger dealers, and thus finally find their way to the larger markets where they are purchased by the

exporting firms and shipped into the United States and other countries. In many cases the gathering of these skins from the more remote districts of countries such as China and Africa consumes many months of time and entails much labor and often hardship to those occupied in the task.

Trade Affected by Seasons.

The exportation of goatskins varies in most countries with the season of the year, and, while in some countries a fairly constant supply is available throughout the year, in others the exports are largely increased at certain periods, and diminished at others. In others still, the exportation is done during some particular season, after which it ceases entirely until the following season.

The season of the year, by which we mean the climatic conditions prevailing during that particular time, also bears an important influence on the nature of the skin and its superiority or inferiority of quality for manufacturing purposes. Again, unusual climatic conditions, such as drought or superabundance of rain, also create important changes in the character of the skins produced in the countries thus affected. It can, therefore, be readily seen that it is most important in considering goatskins in general, and particularly those coming from countries which are more largely affected by climatic conditions, to have in mind the season of the year and prevailing conditions as to whether normal or abnormal at the time of shipment.

Long and Short Hair.

As a general rule, in hot countries the hair of the animal is short and remains so at all times, due to the comparatively uniform heat prevailing throughout the year. Such countries are usually subject to a dry season and a rainy one, which, to be sure, affects the quality of the skins, but does not influence the hair. In cold climates, goats usually take on a longer

growth of hair during the winter season and short hair during the summer season. In such countries, where the change is most pronounced, and more particularly in the most northerly countries, it is customary to shear the hair from the goats after it has acquired full growth, as wool is shorn from sheep. The skins from the animals so shorn naturally have the characteristics of the long-haired animal, despite the absence of the full growth of hair. However, if the animal is not slaughtered during this period, the skin will improve in quality as the season progresses, and the animals receive the benefit of good pasturage. The growth of hair in such cold countries is usually accompanied by a sort of fine woolly undergrowth, which lies close to the skin and can be noticed by dividing or parting the hair. This undergrowth closely resembles and performs the same function of keeping the animal warm as does the fine undergrowth of all fur-bearing animals. From the point of view respecting the influence of this undergrowth upon the quality of the skin and upon the leather manufactured therefrom, it may be said that in most cases and in fact nearly always, it is an undesirable feature, firstly, because the pelt under such conditions is generally lacking in substance, and therefore produces thin leather; secondly, the character of the grain is more inclined to be "sheepy," which term is generally applied in the trade to denote that characteristic of the grain which gives it more of the quality and nature of the sheepskin than of the goat. The pores of the skin instead of being marked and distinct, as in a goat, are more difficult of discernment.

Age of the Skins.

Age is a feature which has a very important bearing on the value and desirability of raw pelts. As may be naturally supposed, the fresher the skin, the more desirable it is for leather purposes, and the more apt it is to be capable of being tanned with the best

results. Age, as here applied, does not refer to the age of the animal, but to the length of time which has elapsed since the slaughtering of the goat. A reasonable amount of age does not materially affect this point, excepting in such skins as have been cured or preserved in a manner other than dry salting or sun drying. Some skins, which will be mentioned later, are cured with a mixture of salt and manure. Others are imported in a wet-salted condition, and others again come from countries where salt is employed in their curing which has a peculiar propensity for absorbing moisture. Such skins, if allowed to remain in a damp place, will gradually absorb moisture and become more or less wet. In this condition they are liable to sweat and heat. All of the aforementioned varieties should be comparatively fresh to obtain good results, and by this we mean that they should not be allowed to remain in a raw condition for a period over one year from time of curing, though no general rule can be laid down to cover this point, as a great many varying conditions exist which might have a large bearing or influence in particular cases. Flint or sun-dried and dry-salted skins may often be kept for long periods, covering three or four years, and even longer, provided the skins are properly preserved, without being materially injured thereby. However, such skins which are by nature more impregnated with natural grease or fat are more apt to suffer than those which are of a drier and more fibrous nature.

Use of Naphthaline.

All skins, and particularly flint-dried skins, which it is intended to keep in storage for a period of time, should be thoroughly strewn with naphthaline for the purpose of preventing moths and worms or bugs from making depredations upon them, as well as to prevent them from heating in the bales. Fresh skins which are sun-dried and packed in compressed bales

are almost certain to heat if naphthalene is not strewn between the skins.

Arsenicated Skins.

In some countries the skins are arsenicated, that is, dipped in a solution of arsenic, which is also a good method of preventing their destruction by vermin. It must be carefully borne in mind, however, that it is not desirable to permit any kind of skin to become thus aged before manufacture, as more difficulty will then be experienced in securing good results, owing to the drying out of the natural fats in the skin, and a consequent weakening of the fiber.

Goatskins of the World.

In the following chapters we shall take up individually and consider separately each goatskin-producing country in detail. It must be borne in mind, however, that inasmuch as almost every country and province produces some goatskins for the purposes of the general information which we are seeking to convey, only those countries whose production is of importance will be dealt with. In some cases the number of skins produced are entirely used for home consumption and are seldom if ever exported to America.

The reader should also bear in mind that very often the identical skins are known under several different names. Some sellers designate them by the name of the province from which they come, while others apply to them the name of the district or even the chief city in the district where they may have been gathered. This may be somewhat confusing to the uninitiated, but, in case of doubt, a glance at the map will make things clear.

Concerning weights and selections, only those which are of major importance will be noted; that is to say, those which go to make up the bulk of the assortments. There are always small percentages of skins which are kept separately and may or may not be included in shipments, which, however, constitute

but negligible proportions of the whole, such as kids, thirds, fourths, bulls, long-haired, etc. In such cases, where any of these grades are contained in important percentages, they will be mentioned.

EUROPEAN COUNTRIES.

Spain.

The goatskins produced in this country are well known as being of high class in every particular. The breed of Spanish goat has been transplanted into various countries, particularly in certain sections of North Africa, such as Algeria and neighboring countries, as well as in some Spanish-American countries, and the resultant stock in these countries is good, and many of the features of the skins bespeak their Spanish origin. Even in so comparatively small a country as Spain, considerable differences are to be noted in the quality as produced in its various districts.

The best skins are obtained in the provinces of Valencia, Catelonia, Barcelona and Seville, and the provinces adjacent to the Mediterranean coast. The provinces lying to the north—Leon and Castille—are also considered among the best for quality. All of these districts consist chiefly of white-haired and faun-colored skins. The district of Estremadura, lying on the Portuguese border, is somewhat inferior in quality; the skins are inclined to be thinner in substance and in general character not quite up to the first-mentioned districts. This is also due to the practice of mixing in skins coming from the Portuguese side, in which the last-named deficiencies in quality are much more pronounced.

The Estremadura skins contain a preponderance of black and dark colored skins, and contain a proportion of slightly longish-haired skins. It must be understood that the comparison just made is as between districts only, while, in general, all of these skins taken together, represent one of the best classes of skins

obtainable. The Spanish skin is noted for its clear, fine grain, and is particularly free from imperfections. The skin is of good plump texture. The skins are well flayed from the animals and bear no evidences of cuts or scores. They are cut open and folded once down the back. In cure, they are flint-dried, barring a small proportion which usually come salted.

The skins are usually classified for quality into prime and second selections, and for weight into heavies weighing about 14/15 kilos per dozen, and regulars weighing 10/10½ kilos per dozen. The smaller skins from the younger animals, known as Chevrettes, are also classified as primes and seconds, and weigh about 7½/8 kilos per dozen. In addition to these, there are also the small kids, which are used for glove leather purposes, and a selection of extra heavies, which weigh about 17/18 kilos, and which are mostly used for furniture leather purposes.

Germany.

Here we have another high-class European skin, which for the most part is used in the country of origin. This is particularly true of the best qualities; the ordinary practice in classifying these skins is, in the first place, to separate the heaviest and finest skins, which constitutes the best selection, and for which fancy prices are obtained from manufacturers of fancy leathers, such as pocketbook, bag and furniture leather. The remaining skins are classified into grades known as A, B, C, which correspond to firsts, seconds and thirds, and are also known as American selection, these goods having been thus classified for sale to American tanners. The weight of these skins is about 220/260 lbs. There are also the heberlinge or light goat and kids, which weigh 100 lbs.

In recent years fewer of these skins have been coming to the American market each year, owing to enhanced values, which have precluded their use for glazed kid purposes. In general, the leather which they produce is clear and fine grain, though they

yield a considerable percentage of lightweight leather, owing to the fact, as stated above, that the plumper skins have already been taken out in the first instance.

The skins are prepared flint-dried, cut open and folded once. The hair is short and mostly white.

Italy.

The skins produced in this country may be divided under two main heads, northern and southern. The northern skins are the better class and embrace the districts of Rome, Tuscany and those districts lying to the north thereof. These skins are flint-dried and are selected into primes and seconds. They yield good weight leather and are fairly clean on the grain. In general they are considered among the better classes of European skins. They are short haired, though a few skins may be found with slightly longish manes and butts. The southern provinces, embracing Naples, Puglia, Calabria and the Island of Sicily, produce skins of considerably inferior quality to those in the north. The Sicilian skins are also known as Messinas and Palermos, these being the chief cities from which they are exported. In general they are lighter pelted and more defective on the grain than the northern skins, the chief grain defects being pits and grubs. The hair is rather longish, and not as fine as the better districts. The Calabrian and Sicilian skins are for the most part dry salted, while the other kinds are partly flint and partly salted. The flint skins weigh about 30/38 lbs., and the salted 28/35 lbs. per dozen.

Austria-Hungary and the Balkan Countries.

Large quantities of skins originate from this section of southern Europe, and are much varied as to character and appearance; though categorically starting with the best variety, they grade downward from a Servian or Belgrade skin, which is a very fine quality and very desirable from every standpoint,

being of good weight and substance and fine and clear grain, to the inferior qualities coming from the Grecian country. Servian skins are limited as to quantity, and, owing to the similarity of appearance, a great many skins of inferior districts are sold under this name. Next to the Servians come Bosnian and Croatian skins, which are slightly inferior in character to the former, the chief difference being that they are not quite as plump in substance and carry more defects as to grain. A small percentage of pitted skins, which are inherent in skins coming from the Balkan states, may be found in these skins, but only to a very small extent. The ordinary weight of the goods is 320/350 lbs. per 100 pieces.

Bulgarian, Macedonian, Montenegro, Thessalian and Ordinary Greek Skins.

These are mentioned in rotation in the order of worth, and are more or less similar in character, but the last kinds are very much more pitted than the first; in fact, Thessalian and Greek skins are practically entirely pitted. The above-mentioned varieties, including the Servian, Croatians, etc., are all cured in the same manner. The skins are flint dry and are taken off the animal in such a manner that the skins remain cased—that is, not cut open—and are stretched in the length. It is a general practice to insert pieces of wood at the shoulders and at the butt, presumably for the purpose of stretching the skins for drying. In many cases this wood is far heavier than necessary for the purpose, and is done in order to enhance the weight, so that it is an important factor, when buying any of these skins, to stipulate the percentage of wood which they contain, as otherwise the average weight stated is misleading and may consist of 25 per cent or more of wood. The ordinary percentage of wood for such skins as Sicilians, Macedonians and Montenegros is 10/15 per cent; the better kinds, as previously mentioned, contain very little wood, only light twigs be-

ing used for stretching purposes, instead of heavy sticks. The pitted skins among these classes, particularly in the intermediate kinds, such as Montenegros and Macedonians, occur for the most part in the necks of the skins, and are most often localized in a small compass in that section of the skin, the balance of the skin being clear and free from imperfections.

In the Greek skins, which are more seriously affected, these pits are more general over the entire skin, though in the former kinds they are chiefly localized at the neck. Tanners in this country are accustomed to designate skins from these districts as "sore necks."

The Greek and Thessalian skins have no heads, while the other kinds have the heads left on. The weights are: Bulgarian, flint, about 320 lbs., salted, 400 lbs.; Macedonian, 330/340 lbs.; Thessalian, 280/300 lbs.; Montenegros, 300/320 lbs.; Greeks, 330/350 lbs.

Bulgarian, Roumelian and Adrianople Skins.

These are chiefly dry salted, though the supplies from the western parts of these districts are flint-dried and in general appearance similar to the above described. The dry salted skins are of entirely different appearance, being cut open and stretched in the ordinary way, and simply folded down the back. The leather produced by these districts is similar in character to the other kind and subject to the same defects. In hair they are short to slightly medium, and in color, mostly dark and black. Classifying them with reference to their comparative worth, they would be placed in the following order: Bulgarian, Roumelian and Adrianople.

The skins coming from the western part of the Balkan Peninsula, including the Greek, Thessalian, Albanian and Montenegro provinces, as well as the Bosnian, Croatian and Servian skins, usually find their way to the port of Trieste, and are exported to the United States from that port. Most of the Macedonian

skins, as well as some of the Greek skins, are shipped from Salonica; the Adrianoples from Dedeagatch, and the Roumelians and Bulgarians respectively from Bourgas and Varna. The weights of Roumelians and Adrianoples is 320 to 340 lbs. per 100 pieces.

ASIA MINOR.

Turkey.

The skins originating in the various provinces of Turkey in Asia are known in the trade under the general title of Levant goatskins. In character, they are inferior to the better classes of skins coming from the Balkan provinces, being coarser in grain and texture. They are drysalted and cured and the skins are cut open and folded flat. The skins are mostly black-haired and of a coarser texture than any before described, and while not considered as longhaired, it is nevertheless of longer growth than most European kinds, and also subject to a slight undergrowth.

On the Mediterranean side, we have the Smyrna, Konieh, Anatolian and Aleppo districts, the quality of which is somewhat superior to the districts lying to the north on the Black Sea coast, including Trebizond and Erzerum. The above described skins produce leather of fair weight, though of coarse grain, and are subject more or less to pits and grubs. Levant skins, using the general title, usually weigh about 330/390 lbs. per 100 pieces.

To the southeast, lies the district of Bagdad, which in quality is inferior to any of the districts of this section. In fact, they might preferably be considered in conjunction with Persian skins produced along the Gulf section of that country, to which they are similar in nature. They are coarse, defective in grain, and produce low-grade leather. They are also drysalted, and the hair is longish and black in color. The takeoff is different from most of the Levant province skins, being cased and stretched, rather to the length than the

breadth of the skin. The usual weight is about 33/39 lbs. per dozen.

Russia.

This is one of the largest goatskin-producing countries, especially so when considered as embracing the whole of the Russian Empire, including Siberia and Central Asia. The supplies are chiefly brought to the fairs, which are annually held at Tjumen and Nijni, Novgorod, and are collected and also sold in the markets of Petropawlowsk, Orenburg, Kazan, and Semipalatinsk. The ordinary Russian goat is known to the trade as Petropawl goat, the city of that name being the largest point of collection. In addition to this kind, there are two other main varieties of skins shipped from Russia—Turkestans and Bokharas.

Petropawl Goat

This description is the best of the Russian varieties which are shipped in quantities to this country, not considering, of course, a small quantity of skins as compared to the whole, which are collected in European Russia, and which are superior to the Siberian skins. Petropawl goatskins are flint-dried and mostly white and light haired. The shorthaired or summer skins are plump weight and yield very desirable leather. The winter skins are longhaired and have a woolly undergrowth; in consequence, the pelt is thinner and therefore not as desirable. In buying these skins, one is compelled, however, to assume a proportionate quantity of all weights and selections. The goat are classified as follows: Primes, weighing 38/40 lbs. per dozen; winter, weighing 48 lbs. per dozen; salted, of which there is usually a small proportion, weighing 37/38 lbs. per dozen, and seconds, weighing 33/35 lbs. The skins are further classified for size and weight, as follows: Werchural, prime and seconds, weighing about 25 lbs.; Mittel, prime seconds and winter, weighing respectively about 20 lbs., 18/19

lbs. and 26 lbs.; Lack, which are virtually kids and weigh about 12 lbs. per dozen.

Russian skins are best and most valuable for manufacturing purposes if quite fresh. In this condition they are soft and contain a great deal of natural grease. If old and stale, they are harder to handle in the tannery and are very apt to be grain cracked. In general, the Petropawl skins are fine in grain, considering the size of the skins, and free from imperfections.

Turkestan Goat.

These skins, if true to their kind, are very similar to the Petropawls, though not quite as good in class. They are somewhat coarser haired, and have more pronounced grain. The general description of quality and selections of Petropawl goat, as above described, would also apply in a general way to Turkestans, with the exception that the latter are somewhat lighter in weight.

Bokhara Goat.

These skins are coarser and more imperfect than Turkestans, and subject to more imperfections of the grain. A great many skins are brought into this section which had their origin in Afghanistan and Northern Persia. They are prepared after the pattern of Bokhara skins and have, therefore, the same general appearance as the latter. This is to a great extent responsible for the low quality of the goods, whereas genuine Bokhara skins are really of very fair quality. The goods are shorthaired and mostly black. They are selected as primes and seconds, weighing about 30/33 lbs., and mittel, weighing about 20 lbs.

NORTH AFRICA.

Algeria.

There are three main shipping ports in this country where goatskins are collected and shipped, namely: Algiers, Constantine and Oran. These skins are all

of similar character, though each has some characteristics peculiar to itself. In appearance, Algiers' goat-skins are very similar to Constantine's. It would be difficult to distinguish them. The latter are considered a shade better in quality. Orans, in the general way, are also similar to the first kinds, but are not as well taken off the animals by the butchers, and may be distinguished by a tendency to contain a considerable percentage of more or less scored or butcher-cut skins. The grain of the skins is fine and clean and the leather produced therefrom is of good substance. In preparation they are cased and cured by drysalting. The hair is fine and in summer time quite short. The winter season skins are longer haired and the general quality inferior, being thinner pelted, and not as clean grain. In color, they contain a fair proportion of white-haired skins and some brown and black. Oran skins are considered the less valuable of the three sorts owing to the defect above described. They are usually classified in three weights, heavies, weighing about 12/13 kilos; middle, weight, 10/10½ kilos per dozen, and lights, weighing about 8/9 kilos per dozen. For quality the usual selection is for primes and seconds, though some shippers have an intermediate selection.

Tunis.

From this country skins are shipped from the ports of Tunis and Sfax, the general character of which is quite similar. They are of the same nature as Algerian skins, but somewhat inferior to them, being not quite so fine in grain and having less substance in the pelt. In other particulars, they approximate them sufficiently not to require further comment.

Tripoli.

This country produces fairly large quantities of skins which are principally collected at Tripoli and Bengazi. In general character, they are plump, fine grained, and produce desirable leather. They have rather longer

hair than any of the above described skins, the color of which is mostly brown and black. They are mostly prepared drysalted, which cure is of a darker color than the salting of Algerian skins. There is also a quantity of flint-dried skins shipped from this country. The salted skins are cased while the flint-dry ones are mostly cut open. They are classified for weight, same as Tripoli and Algiers.

Morocco.

Of the skins produced in this country those coming from the northern section are the best, and of a character similar to the Mediterranean countries of North Africa. The best known among these are the Tangiers and Fez skins. These skins are fine haired, short to medium in length, and mostly of reddish-brown color. They are of an earthy salt cure, brownish in color, and the skins are cased. They are likewise subject to change in character in accordance with the summer and winter seasons, summer skins being the best and producing the most satisfactory leather. The weights are 10/11 kilos.

From the southwestern section are shipped the qualities known as Casablanças, Mogadores and Marrakesh. Of these, the Casablanças are the superior skins. There are two kinds of Casablanca skins, which are designated respectively as red cured and gray cured. The red-cured skins are mostly cased and partake of the characteristics of the Tangier or Fez skins, though not equal to them in general quality, being longer haired and having more grain imperfections. The gray skins are similar in quality to Mogadore skins.

Mogadore.

This variety is much inferior to any of the previously-described North African skins, and are in character quite dissimilar to them, and in appearance as well. Marrakesh skins are to all intents and purposes identical to Mogadores, but are usually some-

what better in general quality, due to the fact that they contain city-slaughtered skins, which have more weight and substance. The skins are cut open and are cured with a mixture of salt and camel manure. They are dirty in appearance on the hair side as well as the flesh, and heavily weighted by the cure. Summer skins have rather short hair and the winter skins longish. The latter are quite inferior in quality, being thin pelted and severely grain damaged. This damage is largely due to fly bites, with which the skins are more or less marked. The hair is rather fine in texture and of a reddish-brown color. The usual weights in which they are classified range from 28/33 lbs. per dozen.

In buying skins of these districts, particular attention should be paid to the freshness of the goods, as they deteriorate materially with age owing to the nature of their cure.

Egypt and the Soudan.

In character the skins produced in this country are different from other North Africans and should, perhaps, not be classed with them; in fact, in the trade, they are not considered in connection with North Africans. These skins are cased and cured by dry-salting. The hair is mostly black and short during the summer, when the skins are at their best, and in winter they are longhaired and thin pelted. The character of the leather which they produce is fine in grain but rather flanky. The grain is quite clean and free from imperfections. These goods are marketed principally in Cairo and Alexandria. The usual weights and selections are as follows: I heavy, 230 lbs.; I medium, 160 lbs.; I lights, 125 lbs.; I smalls, 100 lbs.; II, 100/120 lbs.

SOUTH AFRICA.

Skins in this section are generally known in the trade under the general title of Capes. There are three classes which, naming them in the order of their

comparative value, are as follows: Capetowns, Algoabays and Kaffirs. These are gathered and shipped from, respectively, Capetown, Port Elizabeth and East London. Though some shippers are now sending them direct from South Africa to this market, the usual custom has been to ship them all to London and sold there at periodic auction sales. The Capetown and Algoabay skins are in general character and quality superior to the Kaffir skins.

Capetown Skins.

These are considered as a class among the best qualities of goatskins. They are good to fine grain according to their size, shorthaired and plump weight. In cure they are slightly brined; they are short-trimmed and packed flat with no folding. The hair is mostly white and light colored.

Algoabay Skins.

These are in general character similar to the Capetowns, but slightly inferior in general quality. They are somewhat heavier cured, being rather salted than brined. The hair is also a trifle longer and less smooth.

Kaffir Skins.

Kaffir skins are decidedly inferior to the above districts. They are darker in appearance, more heavily cured with salt, and have longer and shaggier hair. The pelt does not carry the weight which is to be found in the Capetowns and Algoabays, and the goods will yield less measure per pound of pelt when made into leather. They are packed in a similar manner to the first-mentioned varieties.

NORTHEAST AFRICA AND ARABIA.

These two countries will be considered together because of the fact that while they lie on opposite shores of the Red Sea, the supplies from both sections are usually brought from the interior and coast points

of these countries, to the city of Aden, which lies just beyond the southern entrance to the Red Sea on the Arabian side. Furthermore, the skins are more or less of similar character, and are usually worked by the same manufacturers. In the trade these skins are known under the general name of Mochas. We shall first describe the skins coming from the Arabian side. Of these, the best known are the Hodeidah skins. These skins are produced in the Yemen province and are very often shipped direct from the port of Hodeidah without being first brought to the Aden market. A great many skins from the Yemen province, and especially so from the southeastern part, find their way to Aden by means of caravans from the interior and by small native boats from the coast points. These skins are known as Katabi or Gataway and are altogether similar, both in appearance and actual worth, to the skins collected at Hodeidah. They are cased and of a drysalt cure. The hair is quite short and fine and in color mostly white and black. They produce fine-grained leather, but are more or less subject to grain scratches and are also slightly pitted. The assortment made by most shippers is as follows: Heavies, weighing about $2\frac{1}{4}$ lbs. apiece, and regulars, which constitute the bulk, averaging $1\frac{1}{4}$ lbs. apiece. Seconds, weighing $1\frac{1}{10}$ to $1\frac{1}{15}$ lbs. In addition to these main selections, there are also long-hairs, kids and thirds.

Gizan and Jaddah.

These districts constitute the next in importance in point of quantity to the Yemen skins and are very similar to them in general character. In appearance, they differ slightly in color and cure, which though also drysalted, has a slightly reddish tinge. The hair of these skins is also mostly reddish or light brownish. The salting is smoother in appearance and not quite as heavy. These skins are subject to the same sort of defects as the Hodeidahs, the pits in these

skins being more or less concentrated about the butts. Weights and selections are the same as in Hodeidahs.

To the east of Aden lies the country known as the Hadramut, from which supplies of comparatively small quantities are received in Aden. These skins are of inferior type, being mostly thin in pelt. In appearance, they are the drysalted and cased, but are more carefully spread. They are extremely short-haired, which is mostly white. These skins are sometimes known as Salted Adens. The real Aden butcher skins are, as the name indicates, from the animals slaughtered in the city, and are usually of superior quality, being taken from better-nourished animals. These skins are prepared both flint and brined cure.

We shall now describe the districts on the African side.

Abyssinia.

This is probably the largest producing section of Mocha skins. The skins are mostly gathered in the interior of the country, the best-known variety being known as Herrar skins. They are collected in the cities of Herrar and Addis Abeba, and thence transported by means of caravan and railroad to the coast, whence they are shipped across to Aden. These skins are flint-dried, cut open and staked out so that they are quite smooth and flat. They are folded along the back. The hair of these skins is quite short and fine and of mixed colors. The assortment is for firsts, seconds and thirds, there being usually a large proportion of seconds, which sometimes even exceeds the quantity of firsts. Prime skins are usually put up to average from 1.15 to 1.25 lbs. per piece, and the seconds 1 to 1.10, thirds .90 to 1 lb. per piece. The leather produced from these skins is of good weight and fine in grain, also fairly clear of imperfections. There is a tendency, however, to the loss in works of a proportion ranging sometimes as high as 10 per cent, though in average not over 4 to 5 per cent.

Massowah.

This is the port from which the skins produced in the northern part of Abyssinia are shipped to Aden and the skins of this section are known by that name. Those which originate in the interior section are very similar to the Herrar skins just described, so much so, in fact, that they may be considered in conjunction with them. They are somewhat cleaner in appearance, being freer from fat and flesh and, perhaps, slightly better tacked out. Those skins which originate nearer to the coast are of somewhat different character, being chunkier and somewhat coarser. They are prepared both flint-dry, opened and cased and driesalted cased. They weigh as follows: flint-dry, 1.20/1.25 lbs. per piece; salted, 1.35/1.40 lbs. per piece.

Somali Land.

The skins produced in this section are commonly known as Berberahs. They are collected along the Somali coast, the best skins coming from the towns of Berberah, Bulhar and Zeila and their surrounding country. The appearance of these skins and the manner in which they are dried is peculiar to themselves. They are flint-dried and mostly cased; they are stretched in the length in such a manner that the body of the skin is shrunk together. The skins are nearly all white haired and exceedingly short haired. The Berberah skin is the most highly valued of all Mocha skin, as it produces leather of plump weight, fine grain and texture. Its natural defect is chiefly brier scratches on the grain, but not to any great extent.

The skins coming from the northeastern coast of Italian Somali Land are similar to the above described, but inferior in quality to them. They are lighter colored, drier in feel and much more defective on the grain. All skins coming from Somali Land contain a proportion of skins which have been branded

by the natives. In some cases these brands are very large. Such skins should of course be found in the lower grades. These skins are ordinarily classified as primes, seconds and heavies. The primes weigh 1.10 to 1.25 lbs. per piece; the seconds 1 to 1.05 lbs. per piece.

There is usually a small percentage of skins among these which are cut open, and which may be packed separately and weigh slightly less than the cased skins.

Mogdishur.

From the southern part of the Somali Coast are gathered goatskins which bear a strong resemblance in character to Berberas. In appearance, however, they are totally unlike them, being drysalted, and while also cased, they have a different form, being dried in their natural shape. The hair of these skins is white and extremely short. They produce good fine grain leather but contain a percentage of tainted skins. They usually weigh about 1.30/1.40 lb. average. In selection they are classified as first, seconds and thirds, and usually consist of a large proportion of the last two kinds. Owing to the fact that the Port of Mogdishur, from which these skins are shipped, has no good harbor, it is only possible to ship them during October to May, when the seas are quiet.

Mombassa.

This title is given to those skins which are produced in British and German East Africa or Uganda. Since the opening of the Uganda Railway, these skins are brought to the market in large quantities from the interior. They are collected chiefly about the Lake regions and thus afford transportation to the railway head.

These skins are cut open, flint dried, staked out tight and folded once for packing purposes. In appearance they are similar to Herrar skins previously described.

The hair is short and of mixed colors. The leather

which is produced by these skins is plump to fair weight and good grained and fairly clear. The classification is for first, seconds and thirds, usually consisting of 40 per cent to 50 per cent of firsts and balance seconds and thirds.

These skins usually lose from from 3 per cent to 15 per cent in the works, which skins cannot be detected in the raw. This unfavorable feature is thought to be due to improper drying of the fresh skins.

Zanzibar.

A small quantity of skins is shipped from this region. They are cased and drysalted, but not of sufficient importance to warrant special mention.

INDIA.

This is the most important country of the world in point of the production of goatskins, its shipments aggregating upwards of 30 per cent of the entire world's production. Besides the skins exported, in the raw, large quantities are manufactured locally into a bark tannage by native tanners. These skins are known as "India tanned" and are produced chiefly in Madras and some other Southern India cities, and also in Bombay.

Goatskins are produced in all parts of India, the largest quantities coming from the provinces of the Ganges Valley. The character of them in general is what is commonly known as "hard natured," or in other words firm, close fibered and containing less natural fats than what is known as "soft natured skins," such as European, etc.

Patnas.

The best known of India skins is the so-called Patna; indeed, Indian skins in general are very often known in the leather trade as Patnas, even though they may originate in districts quite remote from the Patna region. They derive their name from the city of like

name in the Province of Bengal. All skins, however, from the district of Behar are known by that name.

These skins are of fine grain and practically free from imperfections, with the exception of one fault, common to all skins of Northern India. This consists of small holes which penetrate the skin, though not always entirely, and which are chiefly concentrated along the backbone and near the neck.

Pokahs.

They are known as "Pokahs" and are caused by insects which deposit their eggs under the epidermis of the animals, causing small sores which develop into holes. This defect is principally evident during the hot and rainy season about May to December. During this period the general quality of all Northern India skins is at its lowest ebb, and not only are the skins more prone to grain defects, but also become thinner in pelt substances.

Dinajpores and Daccas.

To the East of Patna lies that section between the Ganges and Brāhmaputra rivers whence come the Dinajpore skins, and from the vicinity of the lower part of the latter river we receive the skins known as Daccas, both of these taking their names from the main cities of their respective districts. These last two kinds are of a superior quality to the common type of Patnas, being somewhat plumper in nature, and cleaner grained.

Regular Patna goat are shipped principally dry-salted. In this type of cure the skins are first cut open and then tacked out very closely, the skin being stretched to the utmost. The salt is then thoroughly rubbed on, and the skins allowed to dry. When shipped flint dried, which is rather uncommon, they are treated in a similar manner, with the exception of the salting process. Dinajpores and Daccas are cured dry-salted, and are not tacked out in the manner of Patnas.

the overstretching being eliminated. Patnas are also shipped in a wetsalted condition, though only comparatively small quantities are thus prepared. In preparing wetsalted skins, they are almost always allowed to remain in their cased condition, and when still quite fresh, are thoroughly rubbed with a mixture of khari and common salt. They are then folded together and packed in casks for shipment. Khari salt is an earthy substance, which possesses cooling properties, and preserves the skins remarkably well. Trouble is sometimes experienced upon the arrival of wetsalted skins at their port of destination, and especially so in winter time, on account of the freezing or hardening of the contents of the casks. This is easily overcome, however, by placing them in a hot room for three or four days, when they will become quite soft and moist again.

Wetsalted skins also cause trouble due to what is known as hair slipping. This is really a beginning of decomposition, which usually affects the grain and causes a "flowering." Almost always this is due not to any fault of the cure, but to the fact that the skins were not cured quickly enough after the animal was slaughtered.

Kushtias and Daissees.

The district around the estuary of the Ganges river produces the best skins coming from India. They are known as Kushtias and Calcutta Daissees. They are in most respects similar to the above described, but are superior to them in fineness of grain, freeness from imperfections, and plumpness of pelt. Of the two Kushtias are the better, the qualities just mentioned being more pronounced in them. These kinds are also shipped in a wetsalted condition.

The drysalted skins from all of the districts above mentioned are brought to the Calcutta market, where they are sold in the local bazaar to the various exporting firms. They are usually selected into firsts, seconds and rejects. They are classified as to weights as fol-

lows: Extra heavies, 850/950 lb. per 500 pieces; heavies, 700/750 lb. per 500 pieces; mediums, 500/575 lb. per 500 pieces; lights, 400/475 lb. per 500 pieces; smalls, 300/350 lb. per 500 pieces; kids, 250/300 lb. per 500 pieces; heavy seconds, 750/850 lb. per 500 pieces; medium seconds, 450/500 lb. per 500 pieces.

The wetsalted skins from these districts, and in fact from all districts, are packed according to measurement, the skins being measured from the butt to the throat cut. They are classified as follows: 40 inches and over; 36/40 inches; 32/36 inches; and 28/32 inches. Seconds in the same manner.

Oudhs and Agras.

To the west of the regions above described lie the North West Provinces; this district may be subdivided into the districts of Oudh and Agra; from these sections the skins are shipped principally wetsalted, as described in the foregoing. The manner of packing is the same, with the exception that in sizing the standard adopted differs to the extent that the smallest size runs from 28/33 inches instead of 28/32 inches, and the next size therefore from 33/36 inches instead of 32/36 inches. The Oudh skins, which are chiefly gathered in Lucknow and Cawnpore, are similar to the Patna skins, but not as good in general quality. They are somewhat longer in hair and are more pokah marked. The general shape of the skins is long and narrow. Compared to these the skins coming from the Agra section are broader patterned but less plump and coarser grain. The hair is longer still, especially at the butts. All of these skins are at times shipped drysalted. This is accomplished simply by drying out the wet skins.

Punjab.

This is a very large district, and produces large quantities of skins. They are almost entirely shipped drysalted; in fact, are received in the principal market, which is Amritsar, in this condition, and are also known

under the name of that city. To this place are gathered skins from a wide spread of territory, ranging from Cashmere on the north to Sindh and Rajputana on the south. The character of these skins is quite different from those previously described. They have a tendency to thinness, and the animals are larger and coarser than those coming from the southeasterly sections. They are longer haired and of a coarser texture. The skins are generally sold on an all around selection of 85 per cent primes and 15 per cent seconds, and for weight 1,000 lbs. per 500 skins, 1,100 lbs., 1,200 lbs. and 1,500 lbs. All of these averages, however, contain all sizes of skins excepting kids.

Southern India.

The general character of the goatskins in Southern India differs materially from the northern kinds. The grain is quite distinctive and not as fine as in the northern skins. On the other hand, it is more uniform and free from pokahs. The chief defect of Southern India skins is briar scratches, to which they are liable. The skins coming from this district are generally known as Madras. Those coming from the Mysore section and to the south thereof are in general quality superior to those from the north. These skins are almost always shipped wetsalted and classified in the same manner as North West Province skins. Some shippers prepare their skins drysalted, in which case they are usually cut open and packed flat.

CHINA.

There are three main ports from which goatskins are shipped out of this country; these also being the markets where the skins are collected from the several districts and sold to the exporter.

Tientsin.

The qualities shipped from this port are all more or less of similar nature. In order of general quality and

excellence as well as value are placed the following districts: Chowching, Shantafoo, Paotingfoo and Tientsin.

All of these are classified as to hair into shorthair, medium-hair and longhair. The shorthair are the best in quality and the medium and long next in order. The bulk of the skins shipped out of this section are medium and longhaired and black in color, the shorthaired being the smallest proportion. Chowching skins are usually stretched in length, Shantafoos are also stretched in this manner, but rather broader than the Chowchings. The other kinds are more or less square shaped. These skins are all cut open and trimmed. They are prepared flint dried and are not folded but packed flat in compressed bales. They are fairly free from grain imperfection, their chief defect lying in their tendency to barrenness and main or scurf, which is also known as "hoggyness." Tientsin and Paotingfoo skins have also a tendency to butcher scores. For selection they are usually classified into primes, seconds and bulls. For weight the averages run about as follows: Shorthaired, 160/180 lb. average per 100 pieces; medium haired, 180/210 lb. average per 100 pieces; longhaired, 200/250 lb. average per 100 pieces.

Hankow.

This port is situated about 600 miles from the mouth of the Yangtse river and secures its supply from the Eastern part of the province of Szechuen and the provinces of Honan and Hupeh.

The skins coming from the province of Szechuen are the most valuable brought to this market. They are flint dried, mostly white in color and plump in weight. They are long-necked, and are packed flat. The grain is fine and free from imperfections. The bulk of the skins is shorthaired and there are but small percentages of medium and longhaired contained in them; for weight they are classified as follows: Shorthaired, 150/175 lb. per 100 pieces; mediumhaired, about 180/

200 lb. per 100 pieces; longhaired, 200/225 lb. per 100 pieces; heavies, 200/225 lb. per 100 pieces; bulls, 275/300 lb. per 100 pieces. They are selected for primes and seconds.

Honan.

The skins from this province are smaller in size than the above, are chunky and have no heads. While a flint dry cure, they are fleshier and not as clean as the Szechuen, are classified for hair in the same manner, but contain larger proportions of medium and long-haired skins; in fact, the shorthair of this variety is not as short as in the case of the Szechuens. The color of the hair is white, grey and black, the largest percentage being of white. The weights are approximately the same as the above, though if anything somewhat lighter. They will not make as much leather per pound, however, owing to the heavier hair and false weight.

The skins coming from the province of Hupeh have the same characteristics as the above mentioned skins, and need no further description.

Shanghai.

There are two varieties of skins shipped to this market, those coming from the western part of the Province of Szechuen, and those coming from the district of Puchow, which are more generally known as "Rivers." This variety of Szechuen goat is similar in most characteristics to the above described, but differs from them in fineness of texture. These are the best and most valuable of all skins shipped from China. They are fine grained and yield plump weight leather. They are particularly free from grain defects and produce chiefly high grades. They are mostly black-haired and practically all shorthaired, the texture being very fine. They are classified for weight as follows: Shorthair, 135/150 lb. per 100 pieces; heavies, 190/200 lb. per 100 pieces; bulls, 225/250 lb. per 100 pieces.

There is also the usual selection for primes and seconds. Though this district is closer to Hankow than Shanghai, the skins are shipped through to the latter port owing to the fact that the merchants of this district have their representatives at Shanghai.

River Goat.

This is one of the inferior classes of China skins. The animals are small sized, and though the grain is fine over the body of the skin, the heads and necks are rather coarse and hoggy. In cure the skins are partly flint dried and partly mud cured. They are cut open and packed flat, have no heads and are fairly trimmed. The hair is quite fine in texture and in color runs to white, grey and black in about equal proportions. In length it is practically all medium and long, the so-called shorthaired River skins having considerable length. There is considerable false weight left on these skins in the shape of flesh and fat. They are packed for weight about as follows: Short medium-hair, 150/175 lbs. average per 100 pieces; medium long-hair, 175/200 lbs. average per 100 pieces; longhaired, 190/220 lbs. average per 100 pieces. Selection primes, seconds and kids.

All classes of China skins are marketed from November to May inclusive. The Tientsin varieties are the earliest to be sold, and their season is over about February-March. The Hankow and Shanghai markets range from December to May.

JAVA.

The island of Java produces comparatively few goat-skins, but these are of excellent quality and deserving of mention. The skins are well prepared, being cut open, closely trimmed and cured flint dry. They are tacked out closely and free from flesh and false weight. The hair is short and fine and the leather produced is plump, fine grained and free from imperfections.

They are selected for quality into primes and seconds and for weight from 75 lbs. average per 100 pieces to 105/110 lbs. These averages and those in between are made up of all sized skins.

SOUTH AMERICA.

There are two large producing countries of goat-skins on the South American continent—the Argentine Republic and Brazil. All of the other countries, such as Chili, Bolivia, Peru, Venezuela and Colombia, produce more or less quantities, which, however, will not be detailed here.

Argentine.

These skins are better known under the name of Buenos Aires, from which place they are shipped. Better qualities of Buenos Aires skins come from the states of Cordova, San Luis and Santafe, those coming from the Pampas region and Tucuman and Salta being inferior. The skins are of two general types, the matadero or butcher skins, and the campos or country skins. The first kind are well handled, being clean and free from flesh and fat, while the latter are somewhat fleshy and earthy cured. The matadero skins are flint dried, and are stretched in their natural shape, folded along the back for packing purposes. Campos skins are also partly shaped in this manner, and partly stretched in length, the body of the skin being shrunk together. In general character, the skins are plump and fine grained, the chief defects being a tendency towards scurf on the grain and scratches. They are selected for primes and culls, also small percentages of bulls and longhair. For weight they are usually classified as follows: Mataderos, 8 to 9 kilos per doz.; campos, 9 to 10½ kilos per doz.

Brazil.

Skins from this country are well known to the trade, as probably the highest grade of all goatskins. The

best skins come from the state of Ceara, next in order being Pernambuco and Bahia. Large quantities were formerly shipped out of this country, and while there are still fair sized quantities obtainable, they have decreased materially. The skins are of flint dry cure, shorthaired and quite free from flesh and fat. The grain of these skins is very fine and the leather produced is of the highest grade. The usual weight is 110/112 lbs. per 100 pieces for the primes; there are also seconds and kids.

MEXICO.

Considerable quantities of skins are produced in this country, the best qualities coming from the southern portion, from the states of Vera Cruz and Oaxaca. The skins are largely classified for particular cities and districts, and even shippers too numerous to be mentioned here. The usual selection is for primes, which are all whitehaired skins, fawn colored skins being kept separately, and culls. The skins are of earthy salt cure and sometimes also flint dry. The weights range from 175/225 lbs. in accordance with their size and cure.

Mexican skins are also known to the trade under the general title of Tampicos. The skins are large and produce plump leather and are fairly fine grain in proportion to their size.

THE DEVELOPMENT OF THE LEATHER INDUSTRY IN ITS RELATION TO THE WORLD'S HIDE SUPPLY

Read By A. H. LOCKWOOD
Before the American Leather Chemists' Association

Reprinted from the Journal of the American Leather Chemists' Association.

Two decades ago there was much discussion in the leather industry regarding the bark supply. There were predictions that hemlock bark would soon be exhausted and our low cost red sole leather would cease to be cut into cheap shoes and exported in large quantities. In those days hides and skins were in superabundant supply and such a thing as a scarcity of hides was not thought of. Today we find these conditions reversed. The chrome tannage, quebracho and other tanning extracts successfully have reinforced the bark supply and no apprehension exists. On the other hand, hides and skins appear to be decreasing steadily in quantity, as measured by demand. To those who have an aversion for statistics and remain unconvinced when long tables of figures are shown attesting that the slaughter of cattle is not keeping pace with the increase of population, the fact that hides and skins continue to advance in cost in all the markets of the world should be a demonstration of the situation.

Value of Statistics.

It is sometimes alleged that there are no reliable statistics upon which to estimate the supply of hides, but the condition is neither better or worse than ob-

tains in other world wide commodities. There are two sets of statistics purporting to give the number of farm animals in the country. The Census Department reports once in ten years and the Agricultural Department makes an enumeration every year. The U. S. Census report was announced. It gave the total range and farm cattle as 61,225,791 head against 67,719,410 for 1900—a decrease of 10.6 per cent. The population of the United States is 92,174,515, against 75,79,940 in 1900—an increase of 21.3 per cent. It thus appears that the cattle which produce hides and the people who consume leather are numerically moving in inverse ratio. If we compare the latest Census Department figures with the Agricultural Census of 1908, a decrease of 10,041,219 head of cattle, or 14.10 per cent is shown.

There are persons connected with the leather trade who have the Bourbon faculty of never learning, although they do forget frequently. Years ago they adopted the postulate that hides and skins are and forever must be in superabundant supply. When confronted by facts and figures such as the live stock census or the decreased slaughter of the big packers they declare that the temporary scarcity will soon right itself because more cattle will be raised.

Less Demand for Beef.

The plain fact many times ignored is that beef has declined as a staple article of diet. Cereal breakfast foods were unknown outside of Scotland when some of us were boys. To-day, the grocer's shelves are filled with predigested stuff ranging all the way from good to bad. I venture to assert that there isn't a man in this room who has had a beefsteak for breakfast this morning. The millionaire, the chemist and the poor newspaper man are united in the modern democracy of an oatmeal, egg and grapefruit breakfast. This dietary change is not a theory but a condition. The refrigerator car has made it possible to transport

southern fruits and vegetables to northern markets and the cold storage plant enables the accumulation of fish, poultry, eggs and other food products in season of plenty to be dispensed during all the months of the year. The development of the poultry and egg business is remarkable. The farm animal census issued last month contained this significant clause: "Poultry shows a greater relative increase in value during the decade than the combined value of all live stock, the increase amounting to nearly \$70,000,000. Poultry now are valued at more than \$150,000,000."

The work of the Government Bureau of Fisheries in stocking our rivers, lakes and coast waters is another important development of the food supply.

Revolution in Cattle Trade.

This revolution in the diet of the people under the operation of the law of supply and demand would have lowered the price of cattle at the stock yards and beef at the butchers if other circumstances had not intervened. Coincident with the decline in the per capita consumption of beef was the cutting up of the vast ranges into farms. The western semi arid plains made economical cattle production possible. But with the settlement of the country, the cowboy and vast stretches of free grazing land are no more. Under the old system cattle were raised on the ranges and finished on corn in the middle West. One after another the cattle feeders have gone out of business. It is misleading to assume that the scarcity of cattle is only a temporary condition. Cattle raisers and feeders and the country banks which have made a specialty of cattle loans, nearly all have been obliterated by the economic change. The distribution of cattle among the states as disclosed by a census bulletin issued November 21st is a demonstration of the passing of the cattle from the ranges to the farms.

Increase of Dairy Cattle.

If we take nine typical range cattle states, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada and Texas, we find they have 12,745,212 head of cattle. A comparison with nine dairy states, New York, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota and Iowa, develops the interesting fact that these central and eastern states have 20,643,857 head. Texas is the largest state in the Union and still has the largest number of cattle—6,721,502 head, or more than half the total number in the nine range states previously named. But the New England states with New York, Pennsylvania, New Jersey and Ohio, have 7,402,583 head. If we take the eight range cattle states, exclusive of Texas, there are only 6,023,710 head, against 6,066,278 head in New York, Pennsylvania, New Jersey and Ohio. Another astonishing contrast may be made between six central and eastern states, Illinois, Wisconsin, Minnesota, Iowa, Missouri and New York, with 16,917,465 head of cattle, and twelve western states, Texas, Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon and California with only 15,734,443 head. Here we have six dairy states with 1,183,022 more cattle than twelve range states. It is also worthy of note that the western states are increasing their proportion of milch cows. Texas now has more than a million head of dairy cattle.

There is an important distinction between range and farm cattle as a basis of raw material for tanning. On the plains, steers are developed quickly and shipped to the feed lots for fattening when only two years old. On the farms as a rule only bull calves and worn out milch cows are sold for slaughtering. A given number of dairy cattle furnish more calfskins but a smaller supply of hides than a similar number of animals on the ranges.

Cattle Supply of the World.

According to the year book of the Department of Agriculture there are about four hundred and fifty millions of cattle in the world, more than half of which are in North and South America. Europe and Asia each have one hundred and thirty millions and Africa and Oceania each have twelve millions. There would seem to be a basis for some sort of hide and leather Monroe doctrine concealed in the fact that there are within eighteen millions as many cattle in the western hemisphere as in Europe and Asia combined. In so far as the leather making and consuming industries can properly take political action we should favor pan-American reciprocity. The North and South American continents are 31.75 per cent of the world's area, have 55 per cent of the world's supply of cattle, but have only 10.40 per cent of the world's population. With the completion of the Panama Canal and the institution of closer business relations with the nations south of us, we should accept our manifest opportunity to dominate the leather industries of the world. There are millions of acres of land in Central and South America exactly suited to the raising of cattle. But the business must be exploited by capital and men from the United States, and live cattle should be put on the free list. The present duty of $27\frac{1}{2}$ per cent is practically prohibitive.

Years ago this high tariff was designed to stimulate cattle raising on our then unoccupied plains. Those who insist upon a tariff on either cattle or hides are reactionary and out of alignment with modern progress.

Expansion of Foreign Trade.

If trade relations were cultivated with Central and South America the United States would be in a position to assume a commanding position in the leather industries of the world.

Our exports of shoes are almost equal to those of the United Kingdom, but we export twenty-eight million dollars' worth of leather to Great Britain's twelve millions. With the preponderance of the hide supply on this hemisphere and Europe, Asia and Africa demanding more leather goods, wide statesmanship would suggest a rapid expansion of our foreign traffic.

There is much evidence to show that the world, while consuming less beef per capita is demanding more leather. This seeming paradox is easily explained. There are many substitutes for beef for food, but no alternative for leather. The world could get along without the flesh of cattle, but not without the hides. The semi-civilized nations are adopting our customs of dress, especially in shoes. Since Lord Palmerston uttered his famous criticisms of the Turk "What can you expect of a people who wear no heels on their shoes," slipshod methods have been corrected to some extent by the introduction of European and American styles. If the four hundred millions of people in China should demand leather shoes as a concomitant of their new government, their wants could not possibly be supplied for lack of raw material of which to make leather. ✓

Increased Domestic Consumption of Leather.

But apart from the task of civilizing the barbarous nations with our improved footgear there is the much less remote condition at home. Our own per capita consumption of leather is increasing coincidentally with our declining supply of hides and skins. Experts tell us that automobiles use two and a half hides each for their upholstering. Leather furniture is in evidence in all semi-public places and grows in favor for libraries and dining rooms in the finest houses. The late census shows a large increase of horse and mules in both number and values so that despite the automobile, harness leather will continue to be wanted in larger quantities. The Census Department preliminary re- ✓

port of the trade in harness, trunks, valises, embossed leather, leather garments, etc., shows an increase in the number of establishments of 24 per cent from 1904 and 37 per cent increase in capital invested.

The shoe industry is not conducted with a view to economy of raw material. Durability is subordinated to style and finish. Many of the popular kinds of leather are sold without guarantee as to wear. They are beautiful but frail and use up raw material rapidly. The 1909 census of the shoe industry shows an increase of 63 per cent in capital invested since 1904 and the gross value of product increased 43 per cent.

Goatskins.

The importance of the goat as a leather producing animal should be considered in estimating the world's supply of raw material. Of course, goatskins are available for light weight stock suitable for fine shoes, upholstery, fancy articles and decorations. The goat is the chief meat and dairy animal in many countries. The best available statistics tell us that there are 100,957,649 goats in the world, of which less than two millions are in the United States and a little less than fourteen millions on this hemisphere. North, South and Central America have less than fourteen per cent of the goats of the world against 55 per cent of the beef cattle. And yet our morocco manufacturers have achieved a commanding position in the manufacture of glazed kid. They now are exporting glazed kid to the amount of about eighteen million dollars a year with what may be termed the raw material situation against them. They present an object lesson of what should be accomplished in the heavy leather trade with the preponderance of hides at hand.

Taking a broad review of the leather situation with regard to the hide supply it would seem that future extension depends upon producing greater quantities of raw material and developing the export trade. The day of small things in the leather industry is passing.

The modern tanner must be a student of the world's markets and able to command sufficient capital to transact a greater foreign business in buying hides and skins and selling leather.

To this end we should demand a repeal of the Sherman Law and the inauguration of a government policy designed to encourage and stimulate international trade on a large scale. It is admitted that powerful corporations are necessary properly to conduct big business. No one will object to government control, but there is a wide difference between regulation and strangulation.

ANNUAL CONSUMPTION OF MEAT BY COUNTRIES.

The annual consumption of meat per inhabitant in the United States is estimated at 154 pounds; Argentina, 282 pounds; Australia, 245 pounds; Great Britain, 104 pounds; Canada, 88 pounds; France, 73 pounds; Belgium, 68 pounds, and Italy, 26 pounds.

THE COMPOSITION OF LEATHER FROM DIFFERENT PARTS OF THE HIDE, AND THE IMPORTANCE OF A PROPER SAMPLE FOR ANALYSIS*

By CHARLES R. OBERFELL

The analysis of a leather may be of value for a number of purposes and the importance of a representative sample somewhat depends on the kind of leather under consideration, as well as the nature of the information desired from the laboratory. For illustration, if a lot of leather consists of "bellies" and it is desired to know the kind and extent of adulteration it is a simple problem to get an average sample. If the consideration is a lot of sole leather, and it is desired to know particularly the extent of the tannage, the problem is complicated. Again, if the chemist in his control work in the tannery desires to know the particular stage in tanning to which the hides have progressed, the problem of an average sample is further complicated, and a representative sample is essential if he is to obtain any exact information.

This need of a representative sample from the whole hide is brought about by the variation largely in the physical nature of different parts. As is well known the fibers on the flank parts are loose and for the most part the hide is thin. Going toward the center of the "butt" or part lying over the kidneys it grad-

*Read at the A. L. C. A. convention, Washington, D. C., December 8, 1911.

ually grows thicker and firmer until in the kidney section we have the choice part of the hide. Proceeding toward the head along the backbone the structure gradually changes and when we reach the shoulder section the hide is thicker and not so firm as the butt, and this increases through the neck into the head. The result of this variation in structure is a variation in the quality of the leather. Parts thin and loose are penetrated rapidly by the tannin and consequently more thoroughly tanned, while heavier and firmer parts are less rapidly penetrated, but at the same time more tannin is physically absorbed and filled in the interstitial spaces between the fibers. We have every reason for assuming that samples taken from these various sections would give different results on analysis. The same is true regarding addition of materials to gain weight. The loosely constructed parts will receive more of these materials than the firmer parts.

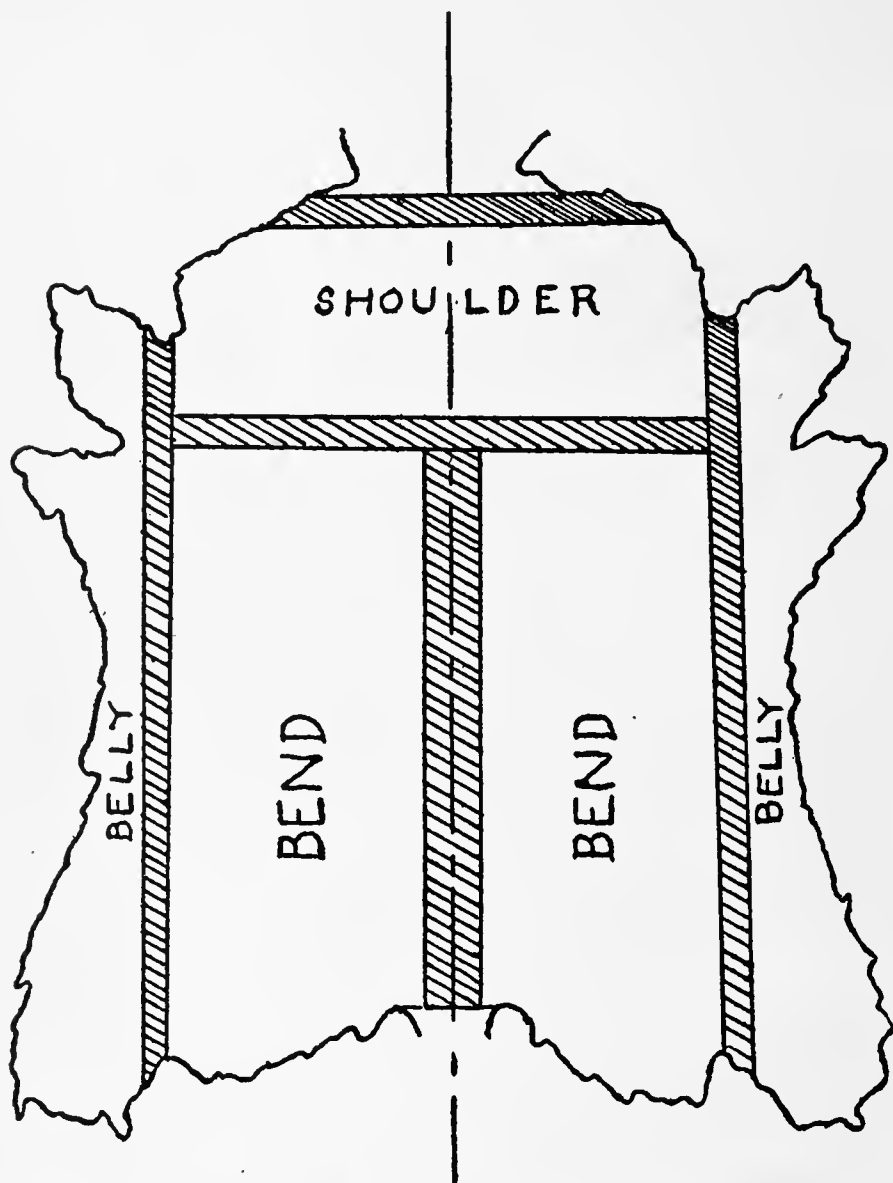
In order to determine the exact conditions anticipated by the foregoing reasoning, I undertook a series of analyses of leather taken from the principal sections, namely, belly, shoulder and butt.

There are certain practical limitations in obtaining a sample of leather, because it would be impracticable to cut into pieces a whole hide to obtain the sample. No one would destroy so much value for this purpose. The samples analyzed were accordingly taken with the idea of getting a representative one with the least mutilation of the parts. Three tanned and finished hides trimmed into bends, shoulders and bellies were selected. From each belly a strip was taken running the whole length, approximately one inch wide, from the inside or cut edge. From each bend a strip two inches wide was cut on the edge lying along the backbone. From each shoulder a strip the same width on the cut edge adjoining the bends and on the neck end.

The head was neglected as it represents less than 10 per cent of the hide.

Figure No. 1 is cut of a hide showing the parts removed for the samples.

The strips were laid off in five-inch blocks, each



block was numbered and the alternate blocks were taken by selecting the even numbers on one strip and the odd numbers on the next, etc. An equal

amount from this sample was then finely divided as for analysis. This made a total of three samples, which were placed in air-tight jars. The analyses were conducted according to the methods of this association, and the results are given in Table I.

Table I.

	Butt.	Shoulder.	Belly.
Moisture	13.16%	12.50%	13.15%
Oil	3.26	4.77	4.63
Uncombined tannin	17.59	19.27	17.23
Uncombined non-tannin...	3.43	3.86	3.60
Combined tannin	18.21	18.83	19.23
Hide	44.24	40.67	42.05
Ash (insoluble)	0.11	0.10	0.11
Tannage number	41.2	46.3	45.7

This gives an idea of the variation likely, as the leather was standard oak tanned stock.

In obtaining a representative sample of the whole hide it must be based on the relative weights of each section. In this case the shoulders averaged eight pounds, the bends ten pounds and the bellies five pounds, or a total of thirty-eight pounds. Accordingly, in making a composite sample fifty-three per cent of the butt sample, twenty-one per cent of the shoulder and twenty-six per cent of the belly was used.

This analysis is given in Table II.

Table II.

	Composite Sample.
Moisture	12.98%
Oil	3.93
Uncombined tannin	17.69
Uncombined non-tannin	3.96
Combined tannin	18.92
Hide	42.42
Ash (insoluble)	0.10
Tannage number	44.6

In thus working for an average sample of a whole hide it will be advisable to obtain the weights of each part, and when this is impossible to use average approximate weights.

An interesting comparison with the results on the composite sample in Table II is the calculated analysis from Table I made up on the same basis as the composite sample.

Table III.

	Composite Sample.	Calculated Analysis.
Moisture	12.98%	13.03%
Oil	3.93	3.93
Uncombined tannin	17.69	17.85
Uncombined non-tannin	3.96	3.57
Combined tannin	18.92	18.60
Hide	42.42	42.92
Ash (insoluble)	0.10	0.10
Tannage number	44.6	43.3

It appears from the results that the foregoing reasoning failed in assuming that the firmest or butt part of the hide has a greater physical absorption of tannin as indicated by the uncombined tannin results. Other assumptions as to completeness of tannage were correct, as there is a big difference between the butt and shoulder composition. There is as much as 3.57 per cent difference in the hide, taking the two extremes and the greatest difference in the tannage number (combined tannin \div hide, per cent), is 5.1 per cent. Also, we notice a greater penetration of oil in the shoulder and belly sections than in the butt. This, it seems, would indicate, as assumed, the better penetration in these parts of any material used for false weight.

The most unlooked for result is the general agreement between the analysis of the composite sample and the belly, and this work seems to indicate that where it is impracticable to obtain a general average sample from the whole hide that it is possible to get

very near the truth by taking the sample from the cut edge of the belly.

These results could have been made more conclusive by additional analyses from either heavier or lighter hides and from other tannages. However, this paper is not the result of a special investigation for that purpose, but rather the result of an investigation undertaken in the general course of my work, to determine how much variation might be expected in the composition of leather taken from the various principal parts of the hide, and I trust, as here presented, they may prove of value to someone.

THE CHARACTERISTICS AND COMMERCIAL ADAPTABILITY OF HIDES

Read By John H. H. YOCUM
Before the American Leather Chemists' Association

Reprinted from the Journal of the American Leather Chemists' Association.

While it is not advisable to write for technical societies articles which are based on commercial conditions, yet because of the fact that so far in the literature of the tanning trade no data are on record bearing on the character and condition of hides, I have felt it worth while to bring before this organization and have recorded for reference the varying conditions and character of the raw material of the tanning industry, particularly in view of the fact that the hide represents from 60 to 70 per cent of the value of the resulting leather.

In using the term hide, I refer to those pelts which are usually worked into heavy leathers, as the trade distinguishes lighter pelts by the term skins or kips. Hides come to the tanner in two general conditions, dry, and green salted; there is an intermediate condition generally known as dry salted, but as there are relatively few hides on the market in this condition and as they are worked in the same manner as are the green salted hides, they will be included under green salted hides.

Dry Hides.

Dry hides are the hides that are taken off, as a rule, on the ranch or at some distance from easy transportation points, and when taken off the animal are

usually hung flesh out and permitted to dry in the sun until the 70 or 75 per cent of moisture normally in the hide when taken off is reduced to 8 or 10 per cent, and the pelt itself changed into a hard and impervious horny substance. During the drying operation, if conditions are not suitable for rapid drying, bacterial action occurs, which liquefies the fiber of the hide. This, when it reaches the tanner or selector, is known as a sunburn, and during the soaking operation these so-called sunburned spots usually drop out. Sometimes the selector can determine from the appearance of the dried hide the extent of the sun burn, and other times the extent of the sun burn is only determined by the tanner during the soaking and stocking of the hides. Such hides come out and go into leather of the selection known as scabs and rejects, or go to pieces in working.

In trade parlance we have River Plate hides, or straight hides and common hides. These two names refer to practically all the dry hides coming from South and Central America. The straight hides are hides going into union and oak sole, harness and upper as Buenos Ayres and Montevideos, taking their name from the point of shipment; these hides are range cattle raised under similar climatic conditions to the Texas hide in the United States, but are not branded so heavily as are the range hides of the United States, the prevalent brand being the result of wire branding which does not occasion the formation of as much scar tissue as does the stamp brand of the States. These hides are regarded as the best of dry hides, and are largely worked into non-acid and the better grades of acid hemlock.

Common hides take their names from the different ports from which they are shipped or the neighborhood in which they are taken off, such as Puerto Cabellos, Maracaibos, Caracas, Costa Ricas, Central Americas and Orinocos, and have varying characteristics as to plumpness, quality of grain and ability to

make gain of leather. They are worked into acid hemlock in its cheaper grades, and the cheaper grades of non-acid hemlock.

Other dry hides come into the market such as Chinas, dry and arsenic cured Buffalos from India, dry Californias, fallen Texas, etc., each having a different value depending upon the character of the skin of the cattle as determined by the climatic conditions of the country from which they come. This, for instance, can best be explained by the selection known as Mountain Bogotas as against Orinocos; the Mountain Bogota cattle, being raised at high altitudes and in a comparatively cold climate, are much plumper than are the Orinocos which are raised in about the same latitude but at low elevations.

Practically all the dry hides coming into this market are prepared for tanning by the sweating process, whereas practically all the salted hides are prepared for tanning by liming. The dry hides, as a rule, go into acid and non-acid hemlock sole leather, the salted hides shipped from Argentine and Uruguay known leather, although some are worked into slaughter hemlock sole.

To the tanner it is essential that the hides worked by a given method of procedure in the tannery should be similar in weight and character, and it is therefore necessary for him to know, in the purchase of hides so as to turn out a given character of leather, the characteristics of the hides from different localities. Therefore, a tanner making acid hemlock from Indian Buffalo hides will pursue a different method in the treatment of the hides in the tannery from that which he would use in tanning acid hemlock from hides obtained in Venezuela or in Central America; he would also have to pursue a different method of treatment for hides from Buenos Ayres or Montevideo. Buenos Ayres and Montevideos are sufficiently like Texas to be worked together; Central Americas and Venezuelas can generally be worked together; Chinas are so vari-

ous in character as to make it a matter of judgment what other hides can be worked with them successfully.

Dry pelts coming into this country and weighing over 12 pounds in the dried condition are known as hides. Pelts weighing in the dried condition between 12 and 5 pounds are known as kips; under 5 pounds in the dried condition are known as calf skins. Selections are made for hides and kips, hides tainted on both sides, badly worn out on both sides, sore shoulder or pox on both sides, sunburns and damage in shipment, no selection being ordinarily made for grubs, ticks or cuts. Practically all these hides are branded.

Salted Hides.

The salted hides that are imported from South America come under three selective names: Frigorificos, Saladeros and Mataderos. The Frigorificos, as the name indicates, are the hides taken off cattle, the meat of which is shipped out of Argentine as frozen meat. The Saladeros are the hides taken from the smaller packing establishments throughout Argentine and Uruguay. The Mataderos are the hides taken from the village butcher shops and the larger ranches, which are brought into the market in the salted condition. Few Mataderos come to this country because of their poor take-off; the Saladeros take-off is about equal to our country take-off, a little better if anything, while the Frigorifico is equivalent to our large packers' take-off. These hides are almost all wire branded, and in that respect do not compare with the native selection in the United States. Practically all of the Argentine and Uruguay hides are staggy, that is, thick in the belly and neck and comparatively thin along the backbone.

Other green salted hides imported into this country are of two types: such cow hides from the north of Europe suitable for buff and lace leather, and such heavy steer hides from the north of Italy, from Switzerland and France, as are suitable on account of their spread for

carriage and furniture leather, and on account of their plumpness for heavy sole, belting and harness leather. No European hides coming to this country are branded, but many have prod marks which are more harmful to the grain than the wire scratches on our natives. The season for grubs varies on the Continent, and is not uniform for North Italian spready hides as against Swedish cow hides, but as a rule, is much later in the year than the grubbing season in the United States. In purchasing such hides, the rule is to make a grub selection at all times by the agent or factor taking up the hides. No general rule as to dating of grub allowances is made on foreign hides as is the case in the United States.

Anglo-American Hides.

Another type of hide coming into the United States is known as the Anglo-American, which is the hide taken from American cattle shipped to England, the hides being returned here. These are of the same character as American hides, their seasonable take-off being from 30 to 40 days behind that of this country. However, these hides are short shanked and for this reason command a slightly better price. These Anglo-Americans are subject to the same brand and grub selections as are our American packer hides. Some of the dry hides from the United States are sold under the term of short shanked, which means that the hide is not taken off from the knee down. In England these trotters are prepared in much the same way that pig's trotters are in this country, and are then dried and sold. For this reason, the Anglo-American hide is from 3 to 5 pounds less in weight as against a like hide here, because of the knee trim.

Domestic Hides.

The green salted hides sold in this country are generally known commercially from their source as packer hides, small packer hides and country hides. The distinction between many of the small packers in the character of the hide that they produce and that of the "big

six" is simply a matter of quantity. Many of these small packers kill the same character of cattle and exercise the same care in the take-off as do the "big six," but because of the quantity killed by the larger packers they are able to give a better selection as to weights, conditions, brands and grubs than is possible for the small packer to do. There are, however, some of the small packers who take off poorly, and therefore these hides must be thrown into the country hide selection. The country hides are the hides taken off by small local butchers, the hides being salted without regard to selection, and subsequently sold to a dealer, who, after collecting from a number of the country hide butchers, makes a general selection for grubs, brands, steers, cows, bulls and weights. Among most of the small packers, however, a realization of the value of selection exists, and natives and brands, cows and bulls are packed separately, so that the tanner may purchase from them hides of a good selection suitable for a tanner's needs.

Packer Hides.

The mode of packing or curing of hides in the United States among the larger packers as well as the smaller packers, after removing and washing down the hides, is to stage the hide and permit the excess of water from the washing down to drain off. This washing down of the hide assists in the removal of the blood and manure and in a way prevents salt stains. It is important in this connection that the packer, to prevent salt stains, should use salt which has been crystallized, as it has been found that mine salt not only contains iron which will cause discoloration in the leather, but in the process of mining, the dynamite used for dislodging must be exploded by caps and small wires made of copper, which, if left in the mine salt, will cause discoloration of the hides, and, for certain purposes, make the hides less valuable. Packer hides, after draining, are selected and placed in packs in which the moisture remaining in the hide furnishes sufficient water for the dissolving of the salt placed

thereon, so that the salt will form a pickle and partially taw the hide. Ordinarily from 600 to 1,000 hides are placed in the pack, dependent upon the weight of the hide; the time from which the last hide is placed thereon until the cure is effected ranges from 30 days upwards. No packer's bed of hides should be taken up, if proper weights are desired, until at least 30 days have elapsed from the time the last hide went into pack.

Selections of Packer Hides.

The selections of packer hides, as adopted by the packers, are as follows:

SPREADY STEERS—6 feet 6 inches and over on stuck throats; 6 feet 8 inches and over on cut throats, measured immediately behind the brisket; suitable for patent, enamel, carriage and furniture leather; selection for grubs; usually sold as of June 1st to January 1st.

FREE OF BRANDS OR NATIVE STEERS—Heavy steers, 60 pounds and up; spready selection taken out between June 1st and January 1st, remaining in January 1st to June 1st; grub selection January 1st to June 1st. This carries the hides from 50 to 60 pounds at 1 cent less. No. 2's of each at 1 cent less. Cut throat hides ordinarily sell for $\frac{1}{4}$ cent less than stuck throat hides. Hides of the native selection on steers below 50 pounds will ordinarily go into native cow hides, as the extremes (under 50 pounds) would sell for 2 cents a pound less than heavy natives, and the packer ordinarily puts these among the cows.

FREE OF BRANDS OR NATIVE COWS—The packer makes a selection of 25 to 45 pounds on these, which are called extremes, 45 to 55 pounds, which are called buff hides, and 55 pounds and up, which are called heavy cows. The extremes are used in the shoe leather and lace leather trade; the buffs almost exclusively in the shoe upper leather trade, either in chrome grains or patent grains, whereas the heavy native cows are used in the belting leather trade and in the furniture and carriage leather

trade. A native hide in the United States is free of brands, or is reported free of brands by the agent taking up the hide. All hides of the packers should properly be taken up by an agent representing the tanner. It follows that there are a few branded hides found among the natives by the tanner, but this results from the fact that by examining the hide on the flesh side only it is impossible to determine a wire brand or a brand that has not penetrated the hide to such an extent as to show on the flesh.

TEXAS HIDES are sold under the terms of heavy, light and extra light. They are all branded, and no selection is made other than for weights and the allowance for grubs. They go entirely into the sole leather trade.

BUTT BRANDED STEERS are steer hides which have been branded on the hip or butt. Ordinarily these show but one brand. They are sold 60 pounds and over; 50 to 60 pounds at 1 cent less, No. 2's of each 1 cent less. These go exclusively into the sole leather trade. The extra light, under 50 pounds, are usually thrown in among the branded cows.

COLORADOS are steer hides which are side branded. No distinction is made if the hide happens to have a butt brand and a side brand, or two side brands, and as a result, clear sides from Colorado hides do not obtain in the same proportion as they do from butt brands, and the brands are usually of a very much larger area and the scar tissue much thicker. It is the habit among some packers to select the Colorados which are plump and sell them as Texas, but the Colorado hide is not from the same animal that the Texas hide comes from; the range Texas cattle are smaller, and have thicker and plumper hides, and are able to produce sole leather of a character which Colorados will not make. All these hides go into sole leather.

PACKER BRANDED COWS sell 25 pounds and up flat, except for grubs.

COUNTRY NATIVE BULLS are selected in such a manner that the 25 to 45 pound bulls are thrown in with the

cows. The 45 to 60 pound bulls are thrown in with the cow selection of buff hides. The 60 pound and up native bull hides are sold as such. Packer native bulls are sold all weights, generally flat; some packers allow a selection for holes.

PACKER BRANDED BULLS are sold as such, flat, from 25 pounds up, and usually go into sole leather.

The tare allowance on packer hides in Chicago and western points is determined by what is known as the sweep tare, that is to say, the agent acting for the tanner taking up the hides picks out 10 hides which are weighed. The salt is then thoroughly removed by sweeping from both flesh and hair side of these hides, they are then reweighed, and the difference determines the tare allowance for that pack. However, if the seller-man acting for the packer, or the broker acting for the tanner, are dissatisfied with this result, 10 additional hides are taken and treated in the same manner, the average loss on the 20 being used as the tare allowance. In New York and other eastern points, the tare allowance is a matter to be determined at the time of the making of the contract, as for instance, July natives may be allowed $1\frac{1}{2}$ pounds tare, whereas February-March hides of the same kind would be allowed 2 or $2\frac{1}{2}$ pounds because of the longer hair and its ability to absorb the finer particles of salt.

Grubbing Dates.

The grubbing conditions established by the packers are as follows:

Native steers are permitted to be grubbed and a grub allowance made between January 1st and June 1st of each year, which is done by sample.

For native cows, the grub allowance is from January 1st to June 1st.

Bulls, both branded and natives, are not selected for grubs.

Texas steers, grub allowance, November 1st to June 1st.

Branded cows, grub allowance, November 1st to June 1st.

Colorados, grub allowance, December 1st to June 1st.

Butt brands, grub allowance, January 1st to June 1st.

Tare.

These tare allowances and grub allowances have been forced upon the leather trade by the packers. In reference to this statement, it is well to call your attention to the fact that the latter part of December native hides will always run grubby, and the early part of June native hides will always run grubby. The weakness of establishing an absolute breaking point when allowance for grubs is made is that on the last day of December no grub allowance is made, whereas on the first day of January it is made. Oftentimes it happens that late Decembers and early Januarys will run 25 per cent grubs, and thus at the breaking point the first of January, a difference in the price per pound on selections or $\frac{1}{4}$ cent per pound on the whole purchase of hides is sometimes made, depending upon the condition of the market. This explains why late Decembers as a rule do not sell at as high a price as early Januarys, and also why late Mays are usually valued higher than are early Junes.

On account of the fact that the grub allowances and tare allowances are such important items to the tanner, it is always advisable to have these allowances determined at the time the hides are taken up. Not only is this advisable because of the above mentioned facts, but it is always advisable because of the fact that packs will come up which contain more moisture, especially in February and March, than is proper, causing the hides to lose an excessive amount of weight from the time of take-up to the time of delivery. The broker when taking up hides should refuse to take up a pack when he finds the conditions such as are not justified, and should demand that before acceptance the hides coming out of pack shall be staged. Packer hides should not be permitted to be taken up and to lie for any considerable time

if it is desired to make even colors in the finished leather, for the reason that salt stains will invariably occur from this procedure.

Tare Before Weighing.

Another point in connection with the taking up of hides is that the tare allowance should be determined before the hides are selected for lights and heavies. If this tare allowance is not determined first, then the breaking point of the scales, as the hides come out of pack, is necessarily not established. The New York practice is much better in this respect than is the western practice, because in the New York practice the tare allowance is established in the contract, whereas in the western practice, it is necessary to take a number of hides, 10 or 20, out of pack as near an average as possible, before the tare allowance can be determined. Suppose the tare allowance is estimated, allowing 1 pound per hide, the scales will then be broken at 51 pounds for lights and 61 pounds for heavies. If it then happens that the allowance is established by sweeping at 2 pounds per hide, or 52 pounds and 62 pounds, then there is a considerable proportion of the hides bought by the tanner which are really of the lighter weight, paid for by him as being of the heavier weight at 1 cent a pound difference because the breaking weights had to be determined after some of the pack had been selected. This is an important item to the tanner, and one which necessitates careful consideration and investigation, and one in which the variation of a pound, whether 61 or 62, may make 1-10 of a cent a pound difference in the net price of the hides.

Country Hides.

The selections under country steer hides are natives, No. 1 and No. 2, 60 pounds and up; No. 1 and No. 2, 50 to 60 pounds; under 50 pounds going into extremes and buffs. Native cows are selected as extremes, 25 to 45 pounds; 45 to 60 pounds, buffs; 60 pounds and up, heavies. In this connection, it might

be well to state that in country hides, bulls under 45 pounds will go into the cow selection of extremes; bulls from 45 to 60 pounds will go into the cow selection of buffs; 60 pounds and up are sold as bulls. Country branded bulls are sold as such, 25 pounds and up. It therefore rests with the tanner or the tanner's representative to see that he gets the selections which he buys.

Ordinarily, all seasons take-off of country hides are sold to the tanner subject to a grub selection. This grub selection means that any hide having one or more grubs that are open from the flesh to the grain is a No. 2; so also a cut more than 6 inches in from the edge of the hide makes it a No. 2, provided the cut passes through the hide. In some sections country hides are classified as No. 2 when containing 4 or more grub holes; all packer hides are No. 2 when containing 5 or more grub holes. The ordinary term used on contracts is "cuts, grubs and No. 2, 1 cent per pound less"; this applies to both heavy and light selections.

Country hide selections:

Native steers, 60 and up, No. 1 and 2; 50-60, No. 1 and No. 2.

Branded steers (both side and butt), 60 and up, No. 1 and No. 2; 50-60, No. 1 and No. 2.

Cows, light steers and bulls, natives: Extremes, 25-45; buffs, 45-60; 60 and up.

Cows, branded: Extremes, 25 and up; buffs, flat for weights.

Bulls, natives: 60 and up.

Bulls, branded: Extremes, 25 and up; buffs, flat for weights.

Percentage of Leather from Different Hides.

It might be well in closing this to call the attention of the chemists here to the different possibilities of making leather from different kinds of hide. Dry hides will contain from 60 to 75 per cent of hide substance, while green salted hides will contain from 22

to 30 per cent of pure hide substance. These variations are due first, to the condition of the dry hide and its length of hair and cure, and on green salted hides, to the seasonable take-off of the hide, cure and condition, there being at least 15 per cent difference between the weight of the hide taken off the same animal in June and July as against February and March. This may be explained by the length of hair, manure and general weakness of the hide at the end of the winter.

It is advisable, in all cases, in comparing hides, to depend upon the percentage of white weight, i. e., the weight of the hides going into the liquor, as a measure of the relation of the hide resulting from seasonable conditions as well as take-up. It is admitted that white weight does not determine scratches, grubs, brands or other imperfections of the hide, but it is a measure of the hide buyer's ability to purchase properly for the tanner's use, so that the tanner may obtain the highest return from the purchased weight of hides; this factor can be so accurately determined that the selling weight from the white weight will not vary more than 1 per cent, provided the tanning operations are uniform.

Discussion on Salt Stains.

Mr. Griffith: I should like to ask Mr. Yocum in regard to salted hides. The great difficulty with salted hides, especially as far as the color of leather is concerned, is salt stains. I have wondered if the difficulty of salt stains as a whole could not be overcome by using a better grade of salt than the packers use. The common method of salting hides in Chicago in some of the packing houses is to spread the salt over the hide and shake it off and brush that salt up and use it over again. Now in that process the salt, which is rock salt in large crystals, becomes coated with albuminous matter, which carries of course a large quantity of blood in which there is good deal of iron, and it seems to me it is rather obvious that the efficiency of the salt is considerably affected by using over and

over again, simply because it is covered and its action is prevented by the albuminous coating that it receives from passing over so many hides. I am sure Mr. Yocum will be only too glad to give us the benefit of his observation and experience in hides, and if any of you have any questions I am sure Mr. Yocum will be glad to tell you what he knows.

Mr. Yocum: In answer to the chairman's remarks, I would say that if hides are taken out of pack and resalted, ordinarily one gets salt stains. It is claimed that this is due to dirty salt, but I have noticed that resalting even with clean salt will produce a greater quantity of the stain in resalted hides than if these hides were worked fresh. The claim that the iron in the blood is the cause of salt stains has never been disproven, and I have considered this was the cause of salt stains. A fresh hide—that is, a hide immediately out of pack—worked immediately, will not ordinarily show salt stains; however, if that hide is permitted to lie awhile or resalted it will ordinarily show salt stains. These stains seem to appear in the locations on the hide where opportunity has existed for the drying out of the hide. There is a certain concern in New York—hide brokers—who advise that hides should be, when they are resalted, resalted with clean crystallized salt. It is true that in using the crystallized salt, the hides do not show as much salt stain; so likely, judging from that, the resalting operation has something to do with salt stain, and it is likely that the added salt stains caused by resalting are due to the condition of the salt. I do not think you are quite correct in saying that the albuminous matter covers up the granules of the salt, say mine salt, to any extent. Probably these granules act as a center to which, for some unknown reason, the iron and other staining qualities concentrate themselves.

I have had occasion, in the last 4 or 5 years, to notice stock with a nasty stain penetrating the hide straight through—it might be as big as a half dollar and it

might be larger—and I discovered that it was due to the copper wires used for the explosion of the dynamite in the mining of the salt. This wire changes to copper chloride and acts as a sort of copper tannage or a tannage which, after the vegetable tannin strikes it, changes to a black color which cannot be bleached out.

Mr. Beardmore: I would like to ask Mr. Youm if he has ever noticed any bad effect on the hides from the metal tags that the hide dealers put on? The reason I ask the question is that I have had hides that were tagged with a zinc tag which had eaten a hole right through. A spot will drop out about as big as a fifty-cent piece. That is only with the zinc tag; the tin tag does not affect it.

Mr. Connelly: I would like to ask Mr. Yocum if he thinks that the seasons of the year have anything to do with the salt-staining of the hide. I remember once in particular some hides coming out of our yard that had only been out of the packer's cellar seven days, and they were badly stained. We seem to get so many more in the summer than the winter that I wondered if the season of the year didn't affect them.

Mr. Yocum: How long had they been packed?

Mr. Connelly: I do not know that. Not over thirty days.

Mr. Yocum: It is quite true that the tendency to salt stain is increased as the weather gets warmer, that is, there seem to be more salt stains in summer than in winter hides, but I do not believe that this is due to any other cause than the fact that the hides in the summer are not as well washed and cooled as they drop into the cellars as they are in the winter time. With February-March hides a great deal more care is taken to wash them down because of the manure on them. More care is exercised in washing down dungy hides than on June or July hides, and on account of the temperature of the water and the cellar itself, the hides are cooler as they go into pack. The result of the

extra washing is that the blood is then removed from the hides; and the result of the cooler temperature as the hides go into pack is that less opportunity for chemical change exists, and consequently less opportunity for salt stain. However, the instance Mr. Connelly cites may be due to the use of dirty and old salt.

Mr. Balderston: I would like to ask Mr. Yocum another question in line with what has just been said. A number of articles have recently appeared in European journals on this question of salt stains, giving a large number of causes to which they are attributed. I cannot now state many, but there are at least a dozen causes and more than half of them are due to substances used in denaturing the salt, which does not interest Americans; but there is one which Mr. Yocum has mentioned and I would like to ask his idea about it. It is said that the blood remaining in the hide becomes a center of bacteriological action which proceeds even in the presence of the salt. That is, there is some sort of chemical action, probably due to bacteria, which produces a stain in the hide wherever blood remains. This statement is made by someone who is supposed to know, and I would like to ask Mr. Yocum's opinion about it. Does the presence of the blood in parts of the hide make a salt stain where the blood is?

Mr. Yocum: I never have done any special work on the subject. I have always taken Dr. Fiebing's statement that the presence of blood containing iron would occasion salt stains if it was not properly washed out, and yet the character of a salt stain is such that it would hardly seem to be caused entirely by one thing. If hides are put in bundles and piled up and left for three months or so, there will be salt stains across the fold of the bundle. I have read some of the articles you speak of in which they say it is bacterial, a change of some of the nitrogenous material into pigments of some sort, but I have also experienced this, that where hides are unhaired and then go

into acid solutions, they do not retain some of the salt stains. It is only where there is an opportunity for the fixation of some compound that is existing there. It would be natural to conclude that the iron in the blood had considerable influence on it rather than any bacteriological action, because if a given hide is put into an acid solution and shows no salt stain, but when put into some solution that is not so acid does show salt stain, it is fair to conclude that the acid had something to do with its removal. It could not have anything to do with the bacteriological action; it would be a chemical action.

Mr. Lockwood: I think the procession of events during a good many years has sort of automatically thrown some light on this salt stain question, and what I shall say will be in line with what Mr. Yocum has said. Probably a number of you remember that perhaps a little less than twenty years ago there were apparently more hides than the tanners could use and the packers frequently carried their long-haired winter hides through the summer and began to take off long-haired hides again with all the previous winter's hides on hand. The salt stain question was discussed 50 per cent more then than it is to-day. It was a great evil, all the tanners were complaining about it and the trade papers were full of talk about salt stains, and of course there were elaborate theories as to what caused the salt stains just as you are expounding theories to-day. I did not understand them then and don't to-day, as I am not a chemist. But as hides began to get scarcer and as packers began to do what they had never done before, sell them in advance of the kill, so that they did not have to carry hides any great length of time, the salt stain business began to fade away.

Mr. Yocum: As Mr. Lockwood has said, there is absolutely no question about the element of time entering into the question of salt stains, but time itself does not explain why we have salt stains. We certainly do have more salt stains on hides that have been

packed a long time or hides that have been repacked than we do on fresh hides, yet the time element itself will not occasion salt stains. We have to go a little further back than that to determine what the action is. Personally I am disposed to credit the theory, as I said before, that it is caused by the iron in the hæmoglobin of the blood under certain conditions of moisture, time and salt.

Mr. Morrison: While we know that time has something to do with salt stains, it is evidently a fact that we get more salt stains from hides that have been salted with dirty salt than we do from a clean, fresh salt, regardless of time, and I have found it that way in my experience; but I have opened bundles of hides where the salt stains along the fold were so heavy it looked like a heavy rust. It goes to show that time has something to do with it, but dirty salt has a good deal to do with it too.

Mr. Yocum: I think Mr. Morrison is quite correct in his statement, because, just as I said here a few minutes ago, there is a certain brokerage house that has advised the packing of hides with clean crystallized salt and they claim that they have not had anything like the prevalence of salt stains that they would if they had used the ordinary mine salt.

Mr. Desmond: I should think that with the conditions ruling in the hide market now, the question of time would be decided, because there are no hides left in pack too long; but aside from that question I do want to say that as a tanner I appreciate very much that the chemists are taking up this question of raw material, which forms 70 or 75 per cent of the largest bill the tanners have, and probably the most uncertain thing that the tanners have and have had for twenty-five years. I believe Mr. Morrison made the statement that some of the packers' hides have salt stains to-day, but it is also true that here and there there are lots of packer hides that have been in the

salt for six to eight months, and it is possible that it is those particular lots which show the salt stains.

Mr. Morrison: I admit that, but on the later months' take-off, that have not been lying in the beds longer than the rules call for, there will be salt stains. I just mention this to show that it is not the lying in the bed so long that creates all the salt stains, but that we get salt stains from hides that are not laid a long time in the beds. I admit there are lots of packer hides to-day that have been in the packers' hands longer than thirty days.

Mr. Yocum: I might say as an explanation of the basis of some of my opinions, that in the last year or so I have had opportunity to see the working of unsalted hides to the extent of probably 20,000 or 25,000 hides, and I have yet to see a hide that has a salt stain on it from stock that had never been in salt.

Mr. Lockwood: To really understand this matter it is well to know that the length of time hides must remain in the cellars is the length of time it takes to make a pack, plus the time required to cure the last or top layer. It is a merchantable proposition and not a mere proposition of curing hides; so that when the packers are killing, they make up the different packs, and of course a pack must be completed and it may take a considerably longer time to complete a pack of a given selection than to cure the first hides that go into that pack. Therefore, while they are selling them as quickly as it is possible, yet inevitably some hides must remain in the pack in salt very much longer than the time necessary to cure them; so that there are always hides lying in salt under every condition, much longer than the time necessary to cure them.

Mr. Desmond: We had more hides than we knew what to do with in 1908, and during the warm weather we were compelled to resalt some of them, and of course we were very careful about the salt used. It was the best rock salt, and to my knowledge there was not a hide in the lot that was salt stained, and I know

we carried some of them along six or eight months, and it is quite possible that if the investigation was carried back into the packer's hide cellar and into the dealer's hide cellar, a good deal of the source of the salt stain would be discovered there.

Mr. Morrison: I am positive of it. I have seen hides that have been in salt for six months and did not show any salt stain. They could all be worked into fair leather. Then again hides from the last month's take-off may show salt stains. If the hide is traced back to the hide cellar you will find a great deal of the trouble.

GLOSSARY

A

@—An abbreviation used for “and,” “at” and “to” in market quotations, the first figure usually being the bid and the latter the asked rate.

Abattoir (a-bat-wor')—A large slaughterhouse.

Aberdeen—A breed of cattle. The hides are black and long haired, suitable for robes and coats.

Allowance—(See Tare.) (See Grub.)

All-weights—Hides or skins not divided into heavy, light or extreme light weight classifications.

Anglo-American—Hides of American export cattle taken off in England.

Angus—A breed of cattle. The hides are black and long haired, suitable for robes and coats.

Anthrax—A virulent cattle disease.

April Hides—Hides taken off in the month of April.

Arsenic—A poison, used in solution, to prevent insects from destroying dried hides and skins.

Auctions—(See English Hides.)

August Hides—Taken off in the month of August.

Average Weights—The total weight of heavy, light or extreme light weights, or all weights, averaged by the number of pieces.

B

Back—The central or middle part of the hide.

Bank—Hides placed in uniform piles to drain off blood or moisture.

Beaver—A triangular wooden frame, or other obstruction, over which cured hides are dragged, to remove loose salt before hides are inspected. The beaver keeps loose salt away from the inspecting floor.

Bed (Killing)—The floor on which dead cattle are laid for skinning.

Bed (Hide)—That part of the hide cellar floor where hides are to be packed. The word hide-bed is sometimes used synonymously with “hide-pack.”

Beeves—Live steers, bulls and cows.

Belly—The edges of the hide.

- Big Four**—The four largest American meat packers: Swift & Co., Armour & Co., Morris & Co., and National Packing Co.
- Big Six**—The six largest American meat packers: Includes the "Big Four" and also Sulzberger & Sons Co. and the Cudahy Packing Co.
- Black Hides**—Long haired hides, dead black in color, selected specially for tanning into robes and coats.
- Bot-Fly**—Cattle fly, which is responsible for grubs in hides.
- Bovine**—Quadrupeds of the genus "Bos"—as, steer, bull, cow, calf.
- Brand**—A mark of identification on hides, made with a hot iron upon live cattle, generally upon calves which roam unfenced ranges.
- Branded Cows**—All cow hides carrying brands.
- Brine**—A salt solution.
- Brisket**—That part of the hide just behind the foreleg.
- Broker**—A hide buyer for the trade.
- Buenos Aires**—A South American port of export for dried hides and skins. The term is expressed in the trade as "B. A." hides.
- Bufs**—Country cow, steer and bull hides, 40 to 60 lbs. in weight in most sections of the United States. In Chicago, the weight range is 45 to 60 lbs.
- Bull**—The male of the bovine species.
- Bullock**—A steer or ox. In cattlemen's parlance, any beef animal of heavy weight is termed a bullock.
- Bundle**—The hide folded and rolled into a compact form suitable for tying with rope and easily handled.
- Bundle Condition**—Hides bought from original bundles, out of first salt and usually in dry merchantable condition.
- Butcher Hides**—Hides taken off by country butchers, as distinguished from farmer and packer hides.
- Butt**—The rump of an animal or hide.
- Butt Branded**—Steer hides branded on the rump or butt.

C

- Calf**—The young of the bovine species.
- Calfskin**—Bovine hides or skins weighing from 8 to 15 lbs. salted. The large American packers grade the weights down from 15 lbs. Dried weights, 4 to 8 lbs.
- Carcass**—A dead animal.
- Carlots**—Hides and skins are usually sold in carlots. Minimum weight is usually 36,000 lbs. (See table.)
- Cased**—Skins or furs pulled off the animals without cutting down the belly.
- Cash**—Hides and skins are usually sold for cash.
- Cattle**—Animals of the genus "Bos,"

- Caul Fat**—An edible fat used in the manufacture of oleo oil and stearine.
- Cellar**—The place where hides and skins are salted and stored.
- Chicago Freight**—Hides shipped to eastern buyers from points west of Chicago upon which seller pays freight to Chicago.
- Classifications**—The selections or varieties of hides and skins.
- Colt**—A young horse. Small horse and pony hides are called coltskins.
- Colorados**—All packer branded steers' hides except Texas steers and butt branded steers.
- Commission**—Remuneration of hide brokers.
- Condition**—Applied to hides; as "bundle condition." Also used in connection with special features attached to hide trades.
- Coolers**—Refrigerated rooms for storage of meat.
- Cordovan**—The rump or butt of a horse hide.
- Corium**—The true skin, as distinguished from the epidermis.
- Corn Fed**—Animals fattened upon corn.
- Country Hides**—Hides from country sections.
- Cow**—The female of the bovine species.
- Credit**—Hides sold on credit usually are exceptional transactions at special prices.
- Culls**—Badly damaged hides.
- Cure**—Method of preserving hides and skins from putrefaction or injury from insects, as Salt cure, Dry cure and Poison cure.
- Cut**—Damage to hide in flaying. Cut hides are second grade.
- Cut Throats**—Applied to kosher hides, with throats cut crosswise, as distinguished from stuck throats. (See Kosher.)

D

- Dairy Hides**—Cow hides from old animals, thin and spready. They are usually short haired in winter, being mostly stable fed.
- Damaged Hides**—Hides imperfectly flayed or with other defects.
- Dates (Grubbing)**—Arbitrary dates upon which allowances for grubs in hides begin or end. (See Grubbing.)
- Deacon Skins**—Calfskins weighing under 7 lbs.
- Deerskins**—The skin of a deer, usually dried in curing.
- Disinfection**—Treatment to prevent disease or its spread among animals and workmen.
- Distillery Fed**—Cattle fattened upon distillery refuse.
- Drop-Weights**—The weight of the hide green as dropped from the bullock,

Dry Flint—The extreme of dryness in hides.

Dry Hides—All hides cured by drying, either sun or shade dried.

Dry Salted—Hides preserved with salt and then dried.

Dewclaws—Horny protuberance on cattle legs. Worthless on the hides.

E

Ear—Ears should be split on green hides to allow hides to lie flat in the packs. (See diagram.)

Earmarks—Metal tags attached to ears of live cattle as a mark of identification.

Edge (Pack)—Side, back and front edges of hide packs, specially built to retain brine.

Edible—That which may be eaten.

English Hides—Hides of English take-off. Usually sold through auction houses.

Epidermis—The cuticle or scarf skin. The outer layer of the skin of animals. The grain side of the hide.

Extreme Light Hides—The lightest selection of hides; 25 to 50 lbs.

Extremes—Country hides 25 to 40 lbs. in most sections of the United States and 25 to 45 lbs. in Chicago and some of the larger market centers.

F

Face—(See Pate.)

Fallen Hides—Hides from dead animals not slaughtered. Usually applied to range cattle hides which are preserved by drying. Hides from animals dead from disease are termed murrain.

Farmer Hides—Hides taken off by farmers. Usually very poorly flayed.

Fell—That portion of the hide on the "round" of hindleg. Hide must be pulled off this portion of carcass, as the hide clings tenaciously.

Felmonger—English term applied to a dealer in sheepskins.

Fertilizer—Refuse of slaughtering plants, manufactured for fertilizing purposes.

Fibre (Hide)—The structure of the hide. (See special article.)

Fill—A section of a pack of hides; composed of back, front and side edges and six spreads of hides.

First—Hides of the number one grade.

Flat—Hides not selected for numbers one and two or weights, or taken as they run, without any selections or gradings.

Flaying—The operation of taking off hides; skinning.

Flint—(See Dry Flint.)

- Flood Hides**—Hides damaged by water and sold at special prices.
- Flesh**—The inner side of the hide—flesh side—next to the flesh of the carcass.
- Floorsman**—Workman who skins cattle; his work consists of flaying the hide on the side of the animal; a sider.
- F. O. B.**—Free of brands; hides from native cattle; native cows, steers and bulls.
- F. O. B.**—Free on board. Delivery of hides by seller ends with the loading of the car.
- Foot**—The shin bone and hoof.
- Free of Brands**—Unbranded. (See F. O. B.)
- Frigorifico**—Applied to hides taken off by South American large packers. Handled similar to packer hides of the United States.
- Front**—(See Horse Front.)

G

- Glue Hides**—Badly damaged hides, in decomposed state or very grubby, unfit for manufacture into regular grade leather.
- Glue Stock**—Hide trimmings, sinews, cords, etc., fit only for manufacture in glue.
- Goatskin**—The skin of a goat.
- Grades**—Various classifications, selections, and varieties of hides and skins.
- Grain**—The hair side of the hide.
- Grassers**—Dairy calves taken from their mothers' milk and fed grass and grain. These animals show cattle hair instead of veal hair.
- Grass Fed**—Cattle fed on grass; range cattle.
- Green**—Uncured hides.
- Grub**—Larvæ of the bot, or cattle, fly.
- Grub Allowance**—Percentage of hides subject to price reduction for grub holes.
- Grubbing Dates**—Dates upon which the grubbing privilege begins or ends.
- Grub Holes**—Hole caused by the larvæ of the bot fly emerging from the hide.

H

- Hair**—Covering of the hide; a protection to the animal.
- Hair Side**—The grain side of the hide.
- Hairslip**—Evidence of decomposition.
- Heat**—Caused by sweating. The early stage of decomposition.
- Heavy Hides**—Hides over 60 lbs. in weight, except native cows over 55 lbs. in weight.

- Heberlinge**—Skin of young goat fed on grass; has same characteristics as kipskins in cattle.
- Hide**—Applied to all heavy skins, especially of cattle.
- Hide Cellars**—Places in which hides are salted and stored.
- Hide Fibre**—(See Fibre.)
- Hide Horse**—Wooden frame over which cured hides are shaken to remove salt.
- Hide Inspector**—Workman who attends to the proper take-up, grubbing and receipt of hide purchases.
- Hide Rollers**—Workmen who fold and roll hides into bundles for shipment.
- Hide Rope**—Used in tying hides for shipment.
- Hide Sweeper**—Workman who cleans hides of salt with a broom when delivery is being made.
- Hide Tariff**—The import duty.
- Hide Tiers**—Workmen who tie the bundled hides, for shipment.
- Hogskin**—The skin of a hog.
- Hoof**—Part of cattle foot.
- Horns**—Projections from cattle heads.
- Horn Scratches**—Damage done to hides by horns.
- Horse Butts**—The hind part of the horse hide, 18 to 21 inches from the tail.
- Horse Fronts**—The forepart of the horse hide. All of the hide except the butt.
- Horse Hide**—The hide of a horse. The front and butt.
- Hypoderma Bovis**—English warble or grub fly.
- Hypoderma Lineta**—American warble or grub fly.

I

- Inedible**—That which may not be eaten. Not fit for food.
- Inspect**—To grade and select hides.
- Inspection**—A scrutiny of hides for imperfections.
- Inspector**—Workman who grades and selects hides, payment being tendered according to the various classifications he makes.
- Invoice**—A bill for a shipment of hides.

J

- June Hides**—Hides taken off in the month of June.
- July Hides**—Hides taken off in the month of July.

K

- Kid**—A young goat. Leather made from mature goatskins is called kid.
- Kill**—Slaughter for a certain period, as June kill, Week's kill, etc.

- Killer**—Used synonymously for Packer, Slaughterer, Seller, etc.
- Kip**—Skins, lighter than hides and heavier than calfskins, weighing 15 to 25 lbs.
- Knife**—Instrument used in skinning cattle, trimming hides, etc.
- Kosher**—Hides from cattle killed according to the Jewish law, often termed "cut throats" as distinguished from stuck throats.

L

- Lap**—The fold of the hide on the edges of the hide packs.
- Lambskins**—Skins from young sheep that have never been shorn.
- Leaching**—Method of extracting blood and moisture from hides. Also applied to bark in tanning.
- L. C. L. (Less than carload)**—Small lots of hides insufficient to make minimum loading weight; take local freight billing; country butcher lots.
- Light Calf**—Calfskins weighing 7 to 8 lbs.
- Light Hides**—Packer hides weighing 50 to 60 lbs., except native and branded cows; latter not selected for weights.
- Light Native Cows**—Packer native cows weighing 25 to 55 lbs. Sometimes they are sold 45 to 55 lbs., with the 25 to 45 lbs. hides called extreme light hides.
- Long-Haired**—Hides taken off cattle in the winter season.

M

- Manure**—Allowance for dung on hides. A manure weighs three pounds. Enough manures are counted to cover the amount of dirt on the hide.
- Marking Hides**—Marking hides for identification through the tanning process by tags, brands, cuts and other marks.
- Matadero**—South American butcher or country hides.
- Maverick**—An unbranded calf on the ranges.
- Murrain**—Hides or skins from animals dead from disease or accident. (See Fallen Hides.)

N

- Native**—Unbranded hides.
- Neat**—Belonging to the bovine species, as bulls, steers and cows.
- Neatsfoot Oil**—Oil rendered from cattle feet.
- Neck Spayed Brand**—Mark of identification by cattlemen.
- New Salt**—Fresh salt which has not been used for salting hides.
- Nijni Novgorod**—Great Russian hide and fur fair.

O

- Oleo Stearine**—Residuum of oleo stock after oil has been pressed out. Oleo stearine tests 51 deg. Titre and less than one per cent free fatty acid.
- Oleo Stock**—Product of rendered edible beef fats.
- Oleo Oil**—Edible oil resulting from the pressing of oleo stock.
- Overweight Kip**—Hides weighing 25 to 35 lbs., usually in the native varieties.
- Overweights**—Hides or skins slightly over the dividing weights of the various selections and gradings. (See Testers.)
- Ox**—A steer.

P

- Pack**—A number of hides placed in a special manner for curing purposes.
- Packer**—A large slaughterer of live stock.
- Pate**—The hide off the face of a beef animal.
- Pattern**—Shape of hide resulting from good or bad take-off.
- Pelts**—Skins of sheep.
- Pepperboxes**—Badly grubby hides.
- Pickle**—Salt solution resulting from the action of salt upon hides.
- Pickled Skins**—Sheepskin slats preserved in a salt solution.
- Plump**—Hides of uniform thickness and solid texture. Summer and fall hides.
- Poison Cure**—A method of preserving dried hides from injury from insects.
- Pony Skins**—Small horse hides.
- Private Terms (P. T.)**—Hides sold at prices not to be given publicity.
- Putting Up Hides**—(See Take-up.)

Q

- Quality**—Texture of hides, as summer or winter quality.
- Quantity**—The number of hides embraced in a sale or car-load.

R

- Raw Stock**—Tanners' term for hides and skins generally.
- Rendering**—Operation of melting animal fats, into tallows, oils and greases.
- Ribby**—Corrugated, as ribby necks or ribby shoulders.
- Robe Hides**—Long haired hides suitable for tanning into robes and coats.
- Rolling Hides**—The operation of folding and bundling hides for shipment.

Rope—(See Hide Rope.)

Rough—Not smooth, as ribby necks, rough haired.

Rump—Butt of hide or animal.

Runner-Kip—Runtly kipskins—thin hide, long-haired and poor quality.

Runt—A runner. (See Runner Kip.)

Rust—(See Salt Stain.)

S

Saladero—South American small packer's hides.

Salt—A mineral used in preserving hides and skins.

Salting—The operation required for the preservation of hides and skins.

Salt Rust—(See Salt Stain.)

Salt Stain—Discolorization on hides, due to iron or copper in salt.

Salt Thrower—Workman who scatters salt over hides when put in packs.

Scale—Used for weighing and testing hides.

Scratches—(See Horn Scratches and Wire Scratches.)

Scurf—Loose tissue on the flesh side of the hide.

Second—A hide of a number two grade.

Second Salt—Salt which recovered and used again in the preservation of hides and skins.

Selection—The act of grading hides and skins. The various grades and classifications of hides and skins.

Shaking Hides—The removal of salt from hides by shaking over a wooden frame termed a hide horse.

Shanks—Portion of the hide from the leg of the animal. The legs.

Shearlings—Sheepskins from which the wool has been shorn.

Shedder—Hides from which the long hair is coming out. Spring hides.

Sheepskins—Skins from all classes of sheep; usually used in connection with wool skins.

Shingled Packs—Hides placed in lapped piles to cure.

Short Hair—Hides with summer hair. Summer hides.

Short Trimmed—Dried hides with heads and shanks trimmed off.

Shoulder—Portion of the hide at the foreleg.

Shrink—The loss in weight between green and cured weights, or loss in weight between billing weight and weight on arrival at tannery.

Side—Portion of the hide from the side of the animal.

Side-Brand—Hides carrying brands on the side. Generally steers—Colorado steers.

Sider—(See Floorsman.)

- Sinews**—Cords in the legs. Country butchers leave these on the hide. They are worthless, except for glue stock.
- Skewer**—Sharpened stick used in punching through grub holes.
- Skin**—A small hide. Used to designate hides of small animals, as calf, kip, hog, colt, fur, etc.
- Skinning**—The act of taking off the hide of an animal.
- Slats**—Sheep and lambskins with the wool removed.
- Slaughterer**—A killer of live stock.
- Slunk**—The skin of an unborn calf.
- Small Packer**—A slaughterer of small size, as distinguished from the "Big Six."
- Sorting**—The selection, grading and classification of hides and skins.
- Spayed Brand**—Identification mark on live cattle.
- Split Ears**—(See Ears.)
- Spongy**—Hides with little solidity of texture. Mushy in the feel.
- Spores**—Germs of the anthrax disease. (See Anthrax.)
- Spread**—One operation in the building of hide packs. The range in market quotations.
- Spreaders**—Workmen who place the hides uniformly in the packs.
- Spready Hides**—Thin hides of over average width across the shoulders.
- Stag**—A castrated bull.
- Steer**—Hides from castrated males of the genus Bos.
- Stock**—Live stock.
- Stock Yards**—Market places for the sale and slaughter of live stock.
- Strike Hides**—Badly flayed hides taken off by novices during strikes of expert workmen.
- Strings**—(See Hide Rope.) Average uniform length of hide strings, seven feet.
- Stuck Throats**—Hides with throats cut lengthwise—not koshered.
- Sweep Tare**—The allowance granted for moisture in hides when shipped.
- Switches**—Cattle tails.

T

- Tags**—Mark of identification for hides.
- Tag Ends**—Small portions of hides on edges partially detached.
- Tail**—Appendage on the butt of the hide, with switch cut off.
- Tail Weights**—Green weights in England are marked on tail with knife cuts.
- Take-Off**—Condition resulting from flaying, or the seasons, "good take-off" or "March take-off."

Take-Up—The pulling apart of a pack of cured hides, classifying, sorting, selecting and grading. The delivery of hides.

Tankage—Refuse of slaughtering plants, manufactured for fertilizing purposes.

Tare—Allowance for moisture in hides when delivery is made. Allowance to cover shrinkage in transit.

Tariff—(See Hide Tariff.)

Testers—Hides weighing just at the test weight, i. e., light native cows which are sold up to 55 lbs., testers' weigh 56 to 58 lbs., applicable to any grade and selection of hides.

Test Weights—Weights agreed upon to test for heavy, light and extreme light hides, as 61 lbs. and over for heavies, 51 to 61 lbs. for lights, etc.

Texas Steer—Hides of cattle from Texas. Branded steers, plump, narrow through the shoulders and of solid texture.

Texture—The quality of the hide fibre. The feel, as hard, soft, spongy, etc.

Throat—The sticking piece. All hides are either cut or stuck throat.

Tick—Insect pest causing Texas fever in cattle.

Tickicides—Means of killing ticks.

Ticky Sides—Leather showing tick marks.

Trade—A sale.

Trim—Method of shaping hides, as "long trim," "short trim," "heads and shanks off," etc.

Trimnings—Pates, shanks, etc. Tag ends cut off hides, meat, etc.

Tying Hides—Operation of fastening bundled hides with hide rope, for shipment.

U

Unhairing—Process of removing the hair in the tannery.

Uruguay—Hides from Uruguay.

V

Value—The worth of hides; the market price.

Vat Rendering—Process of making tallows, greases, oils, etc.

W

Warble-Fly (*Hypoderma Bovis*)—English cattle fly, causing grubs in hides.

Weight—Operation of ascertaining weight of hides in shipment. Hides are sold by the pound and are weighed before shipment.

Weights—Classifications of hides, as green, cured, heavy, light, extreme light, test, tare, etc.

White-Weight—The weight of hides after unhairing and before tanning.

Wire Brand—Brand on hides, made upon live cattle with a heated wire. These brands are usually small and hard to find.

Wire Scratches—Damage to grain side of hide, caused by barbed wire.

Advertising Section

The following pages contain display advertising of an important and interesting character and are commended to the serious consideration of readers of this book.

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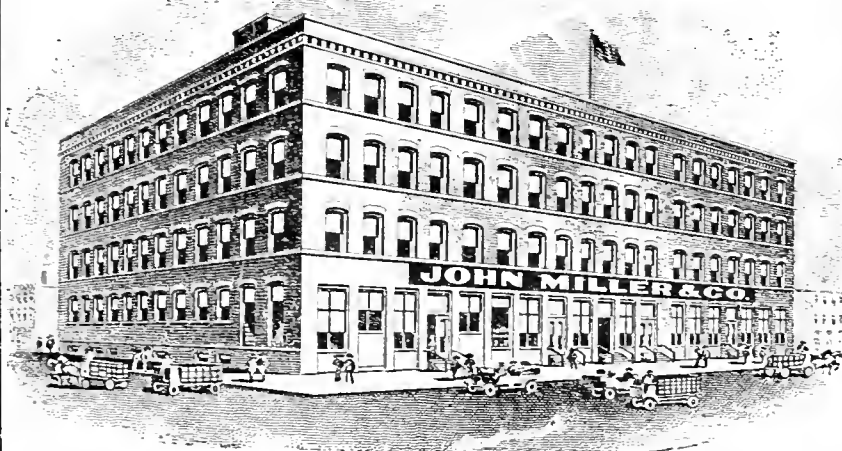
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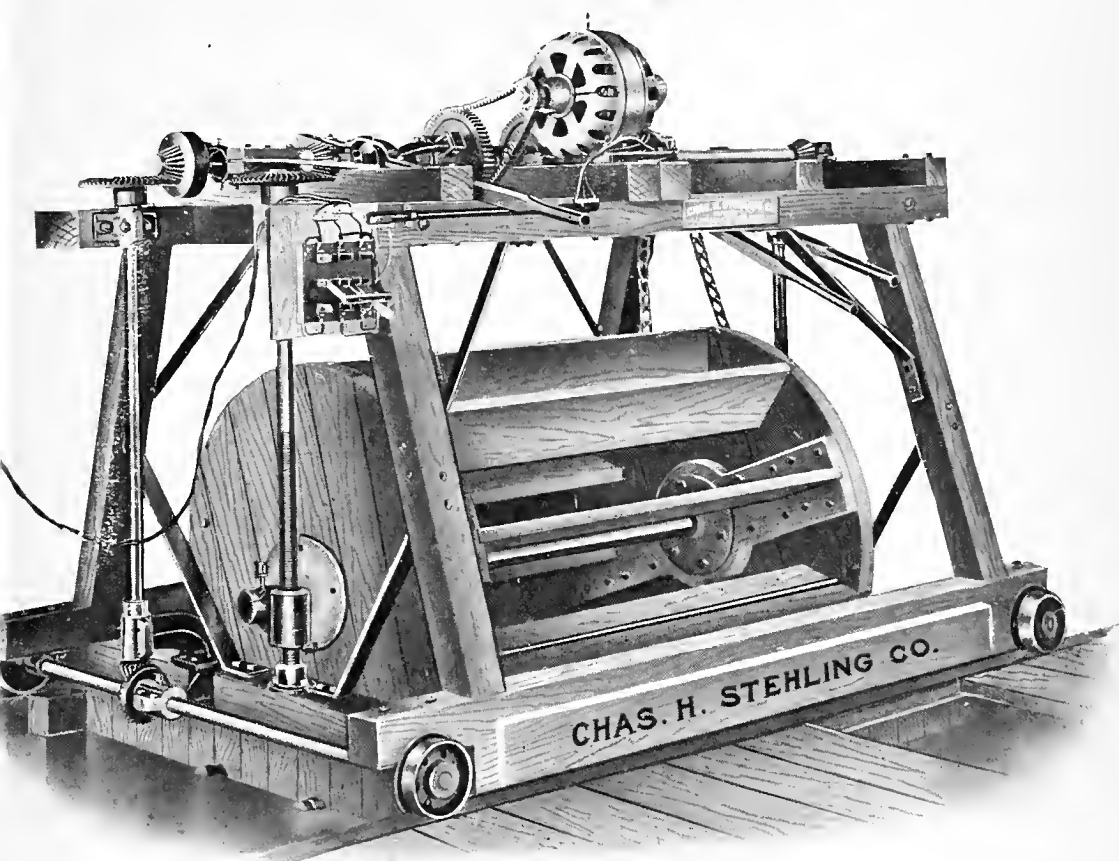
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Chicago Daily Hide Report

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*Compiled by expert market reporters who are among the trade in Chicago
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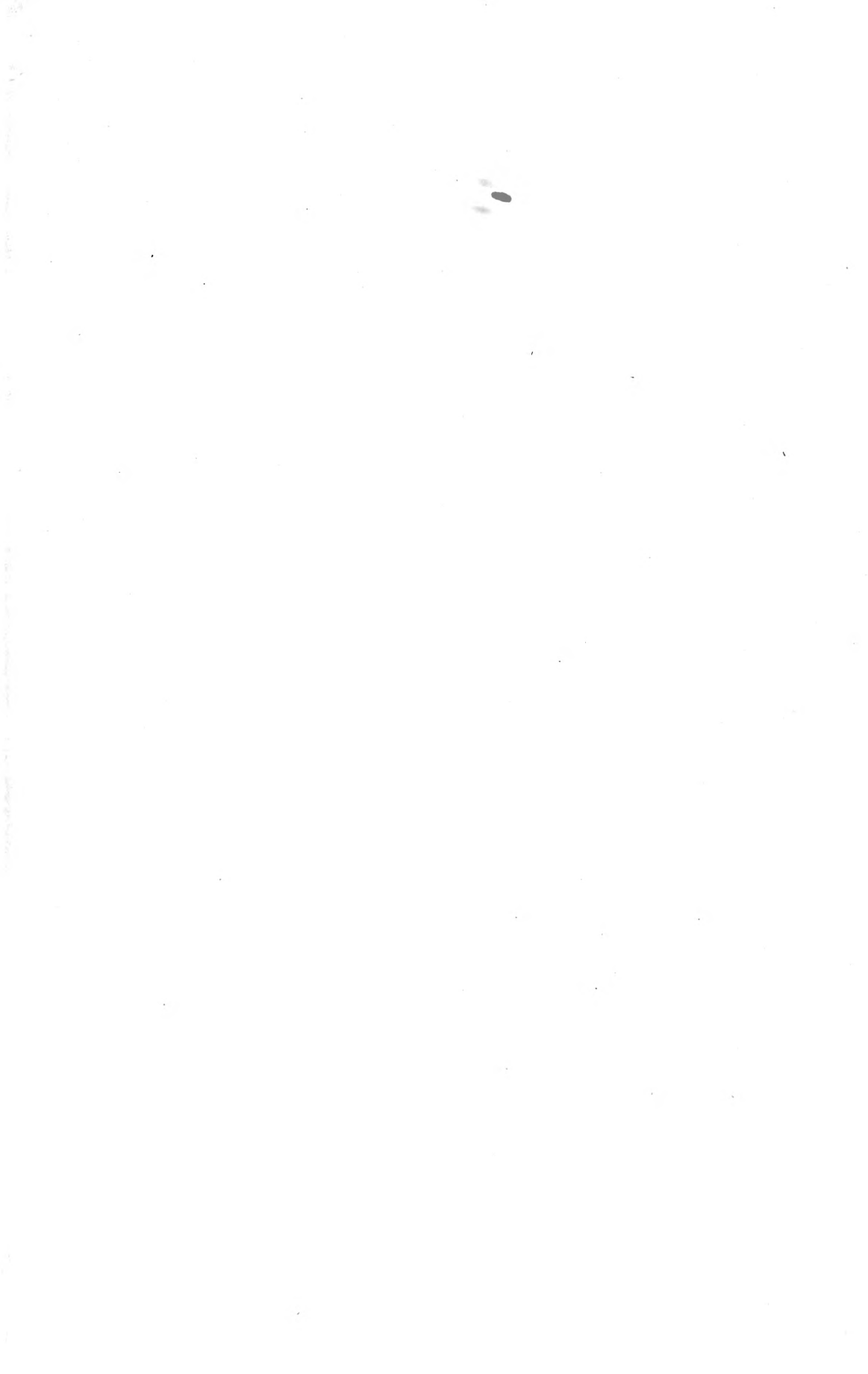
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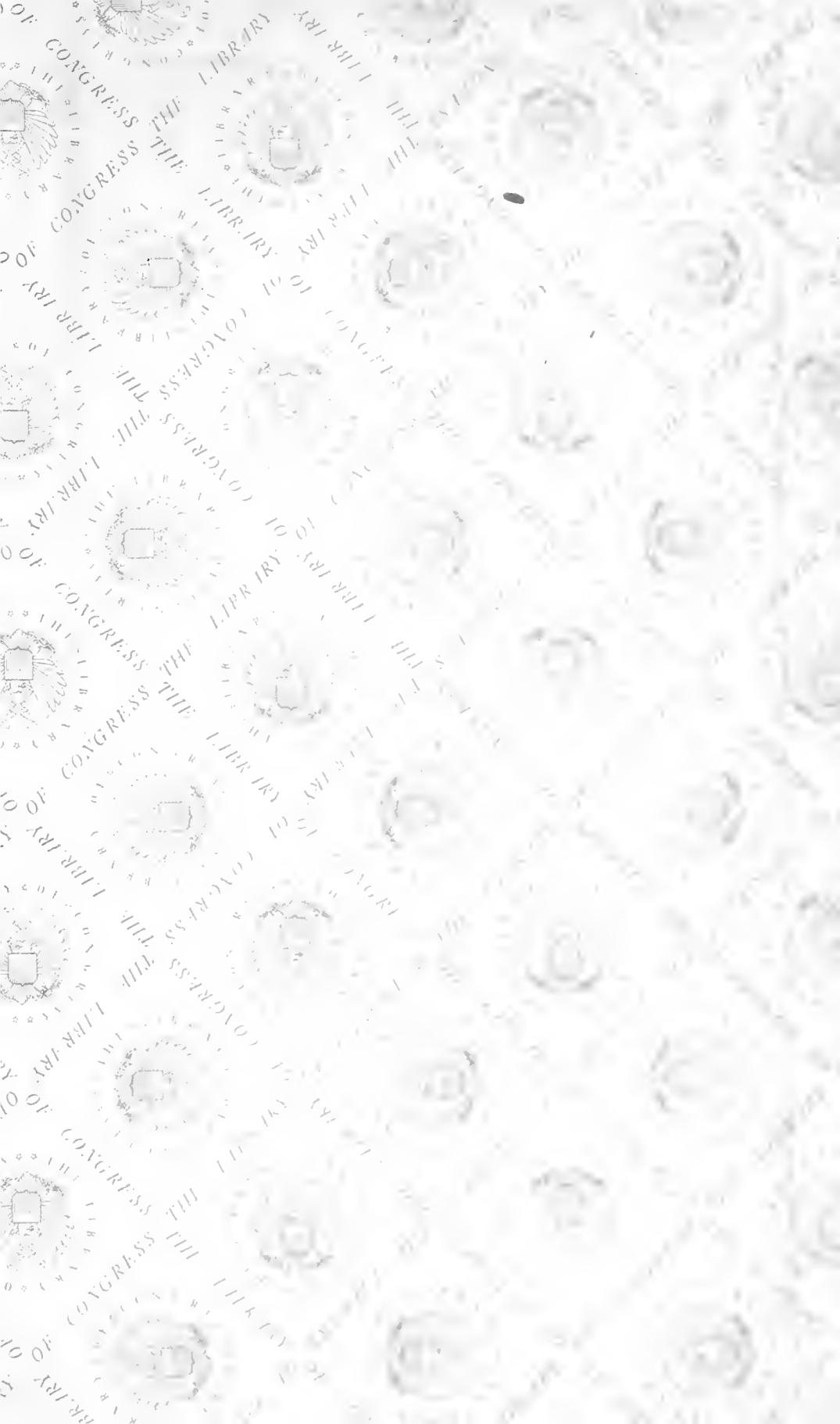
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